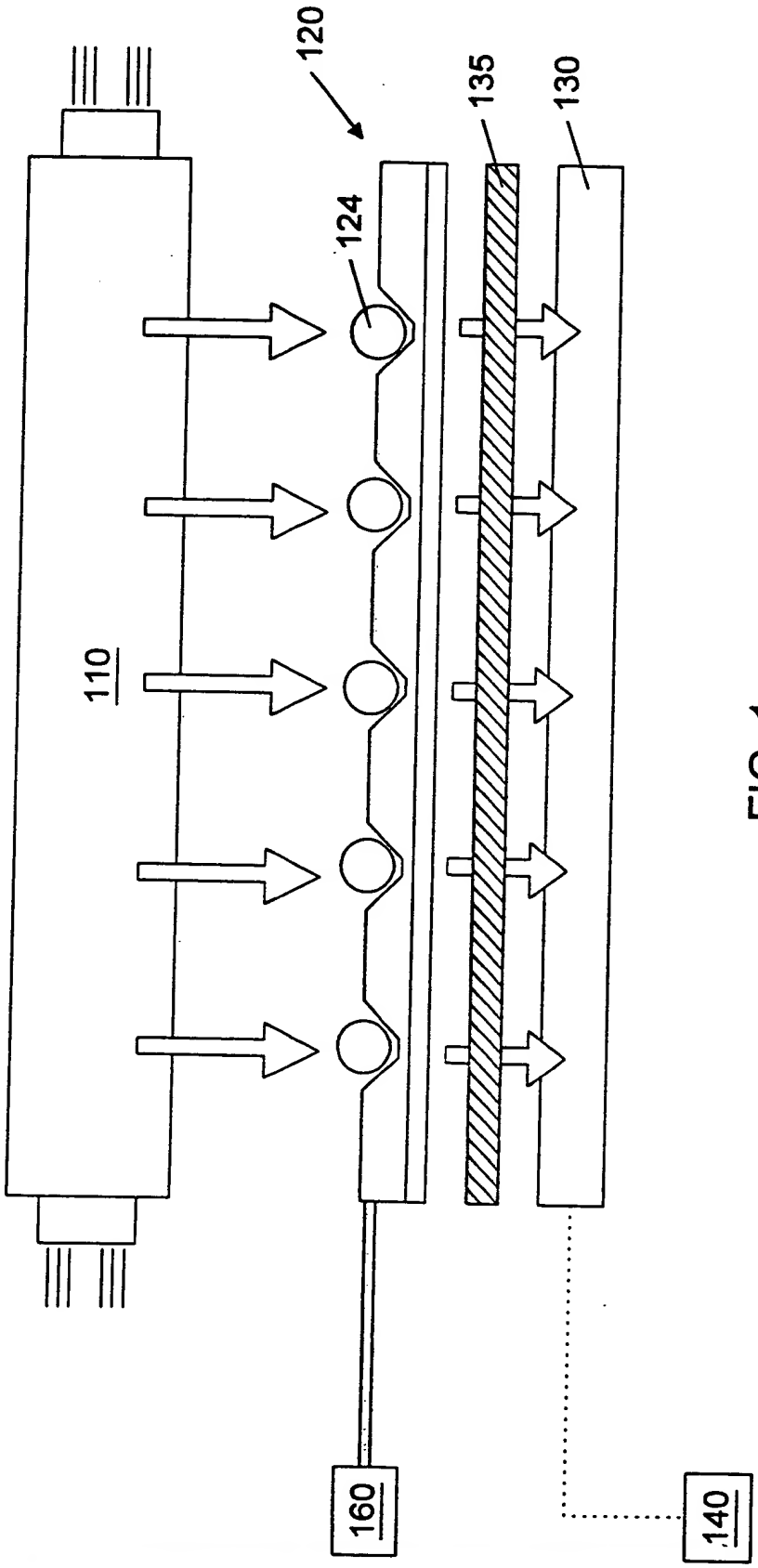


FIG. 1

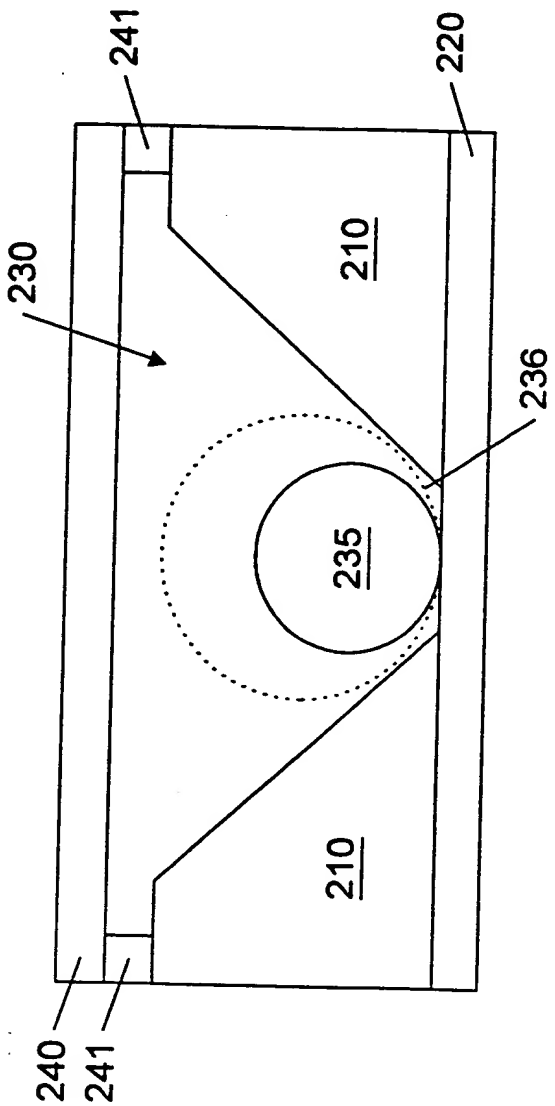


FIG. 2

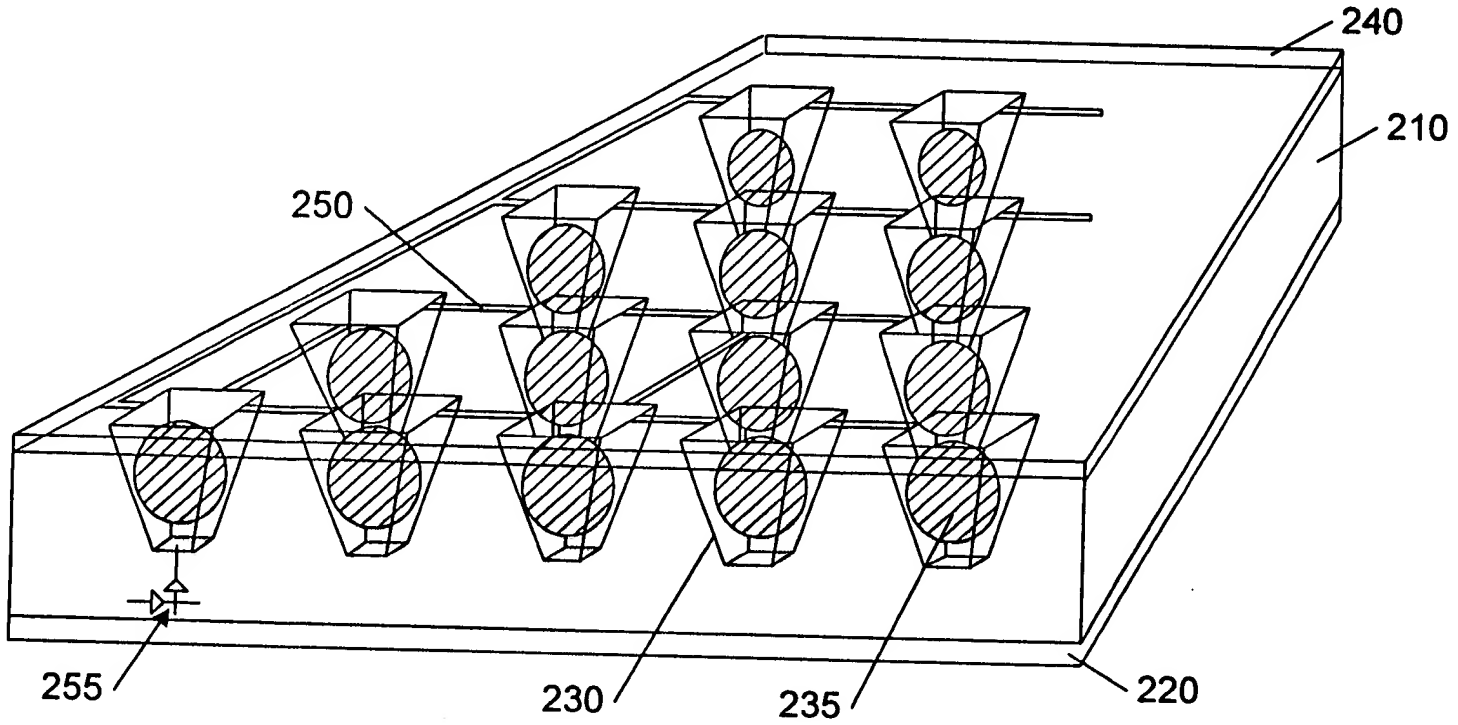


FIG. 3

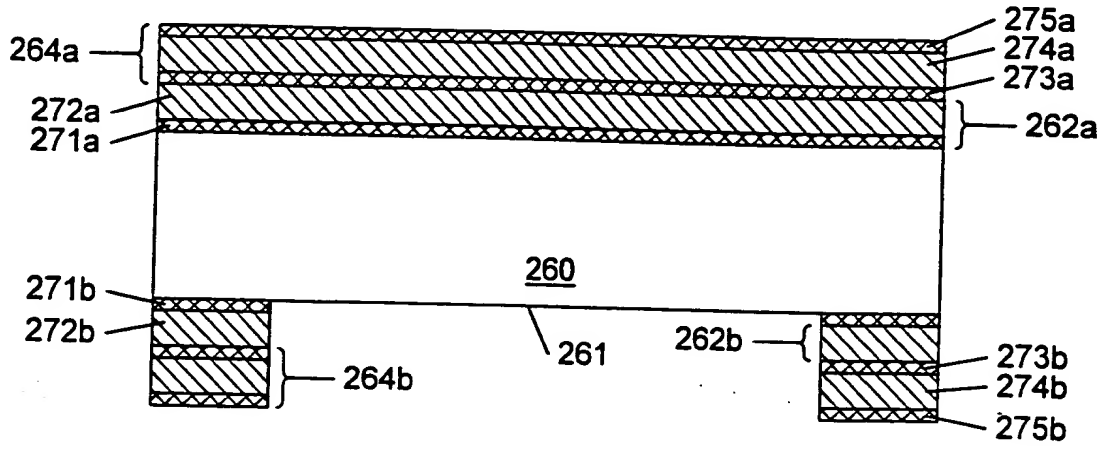


FIG. 4A

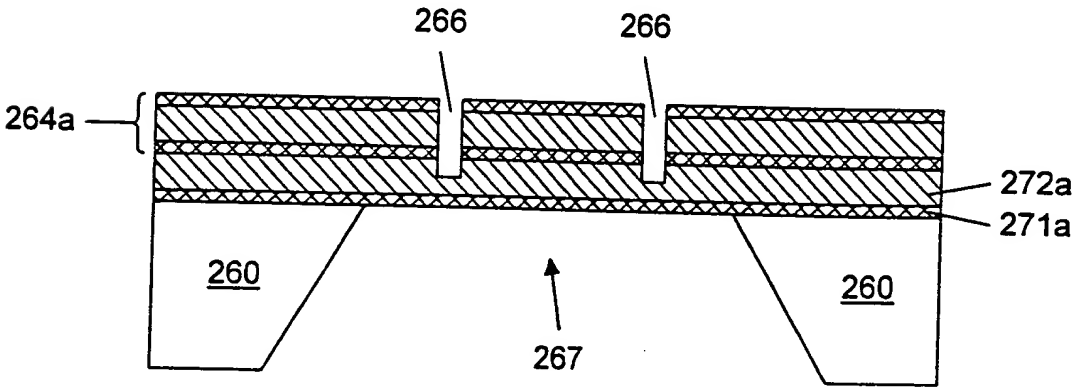


FIG. 4B

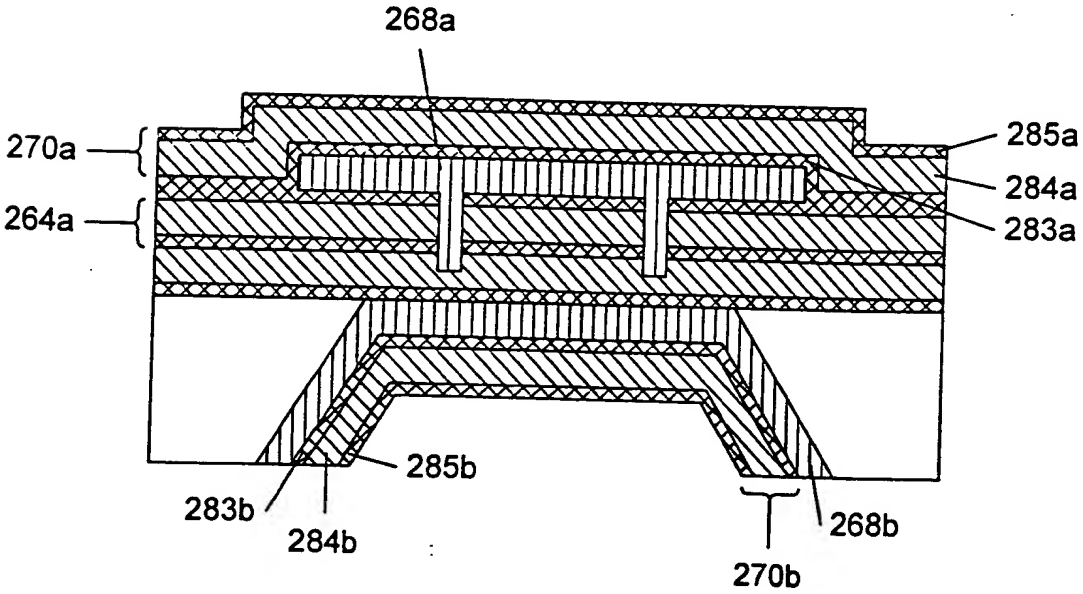


FIG. 4C

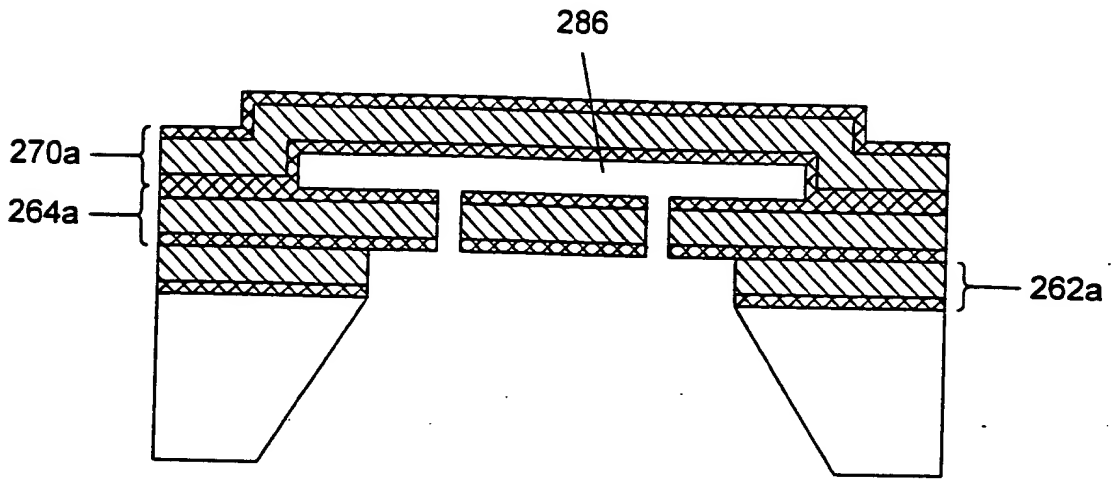


FIG. 4D

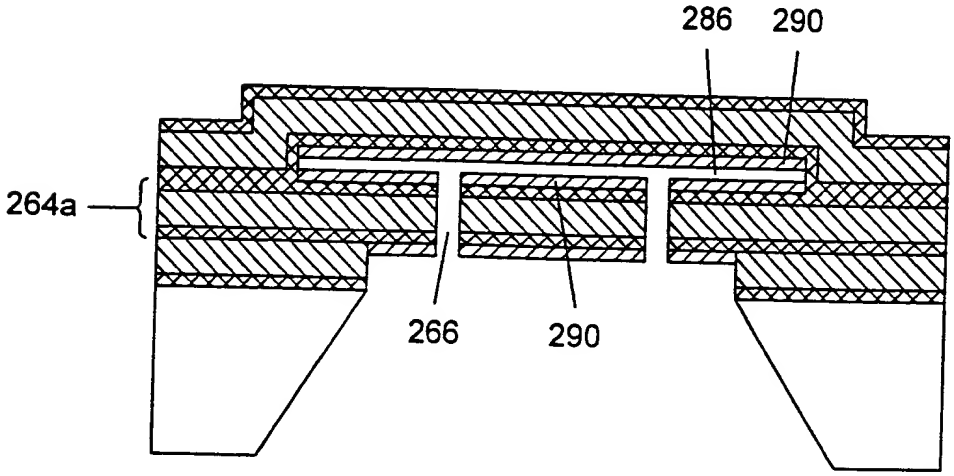


FIG. 4E

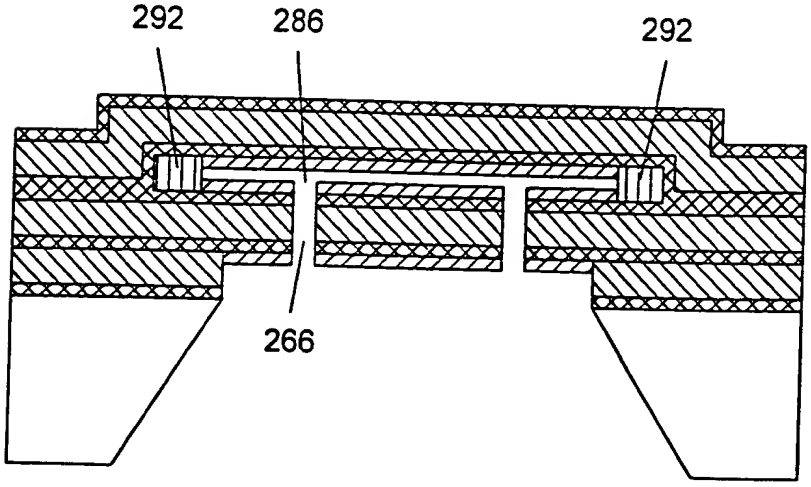


FIG. 4F

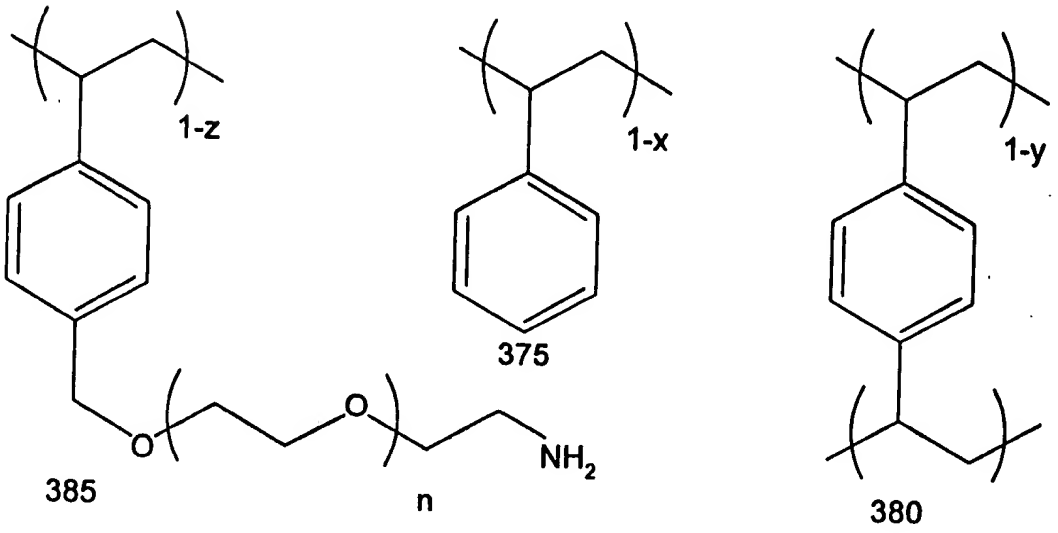
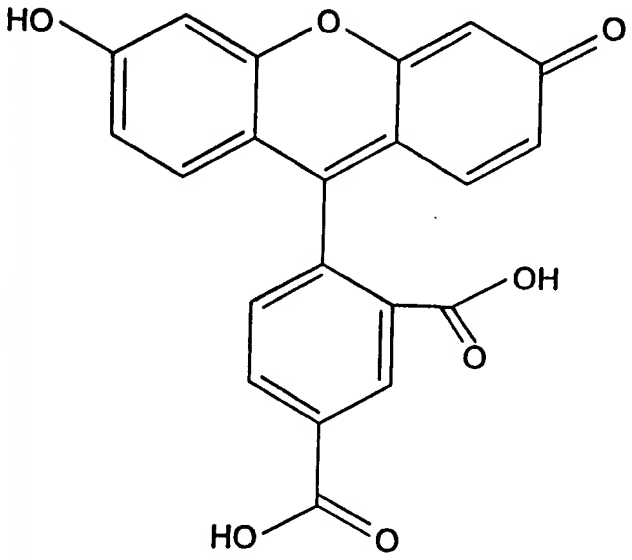
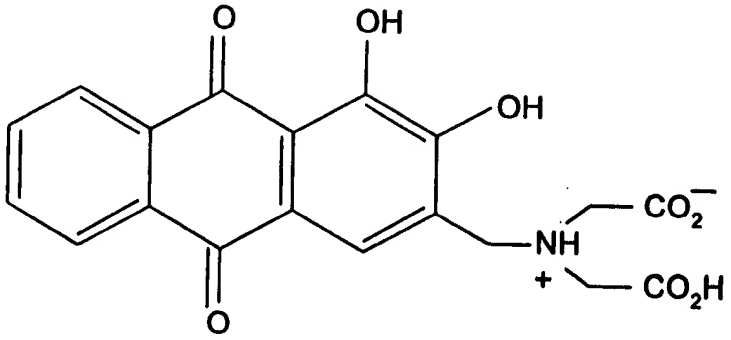


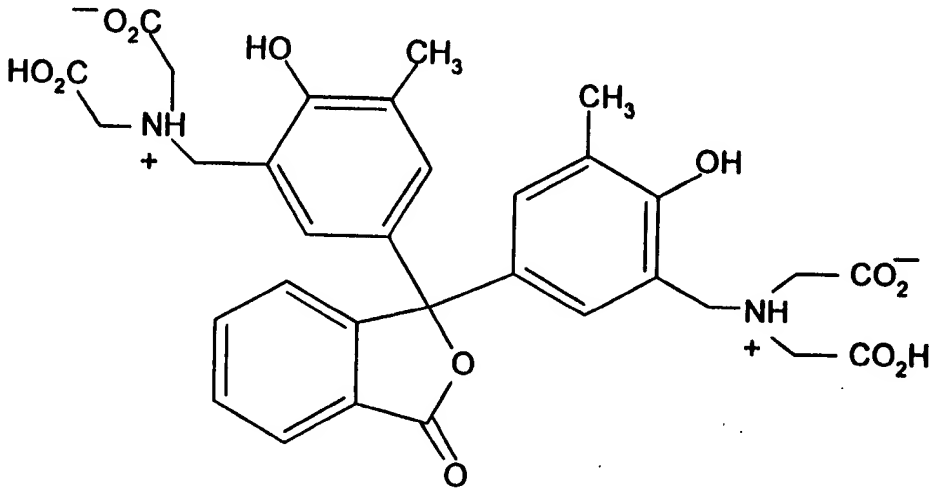
FIG. 5



5-carboxy fluorescein



alizarin complexone



o-cresolphthalein complexone

FIG. 6

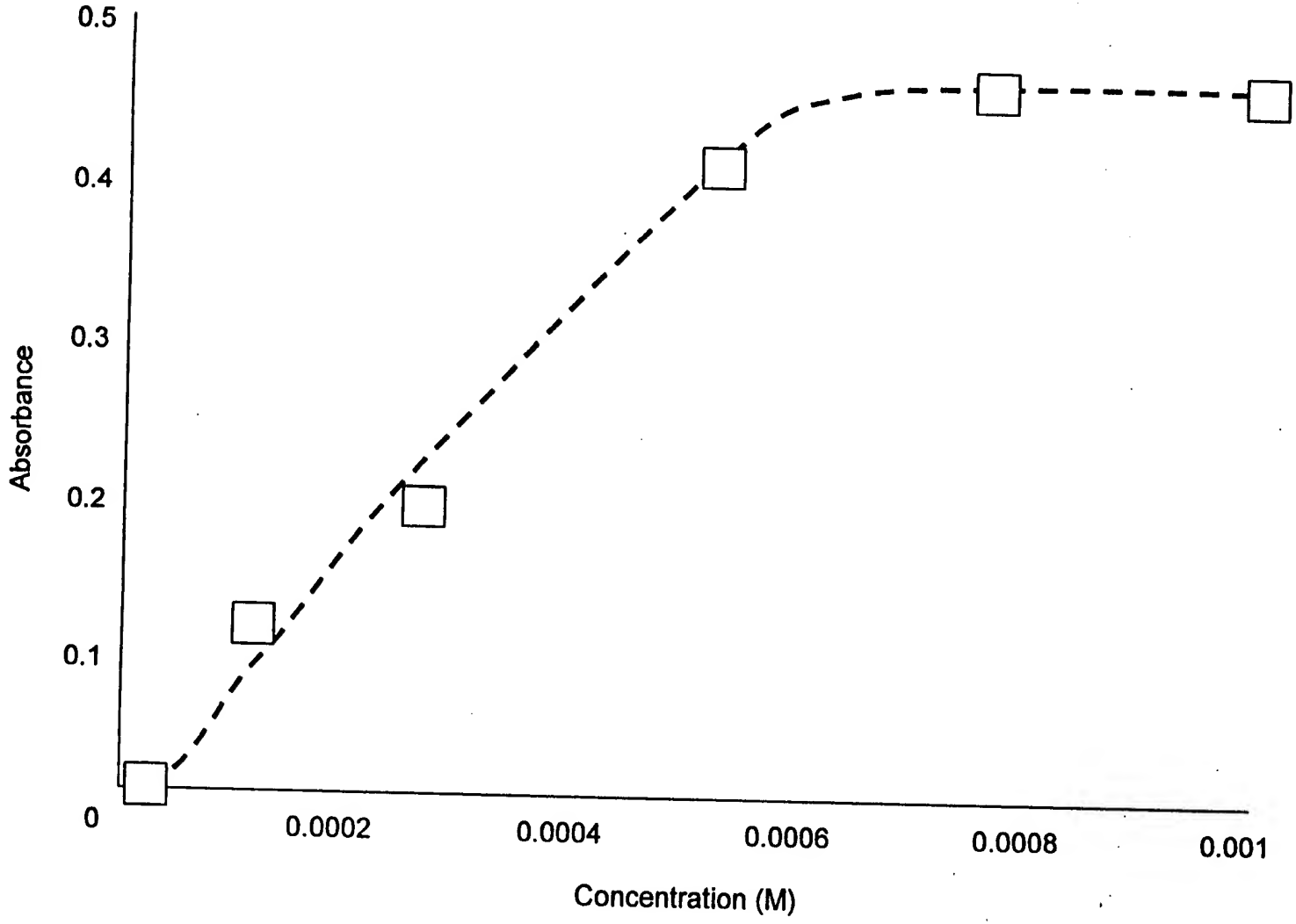

0.5
0.4
0.3
0.2
0.1
0
Absorbance
0.0002
0.0004
0.0006
0.0008
0.001
Concentration (M)

FIG. 7

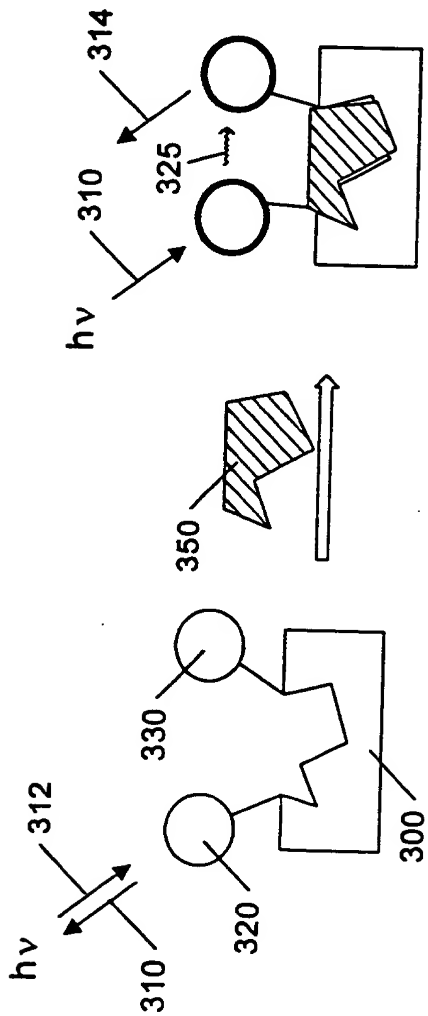
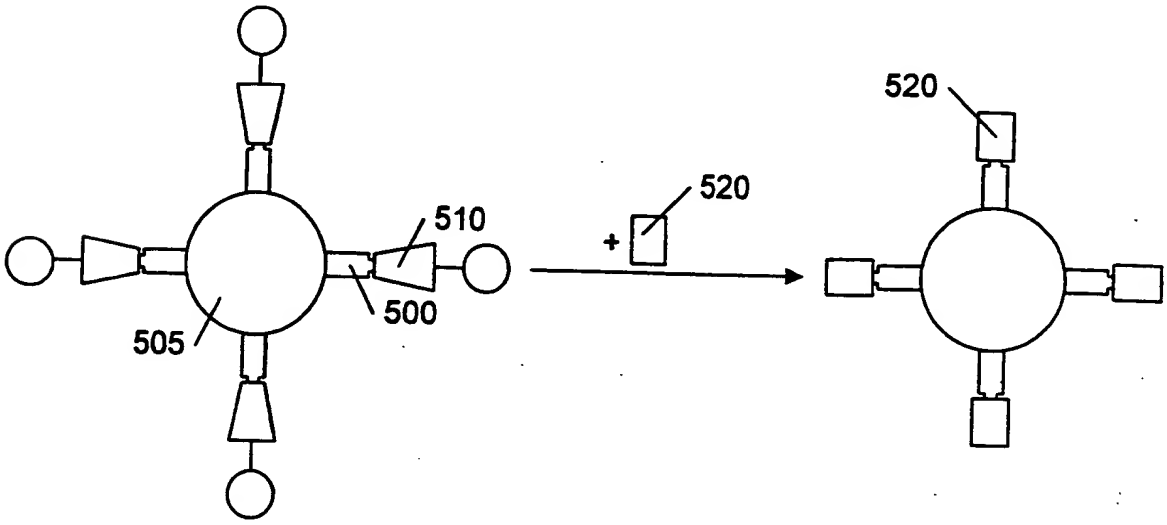
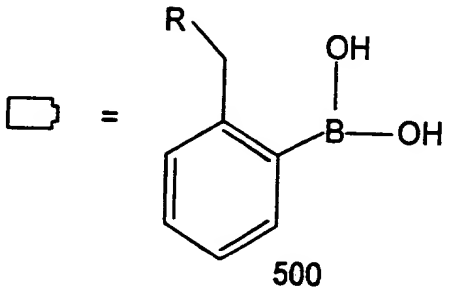
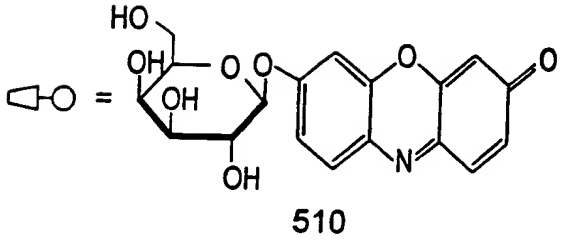


FIG. 8


520
520
+
510
500
505


R
OH
B
OH
=
500


HO
OH
O
O
OH
OH
O
O
N
=
510

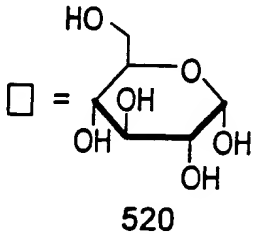
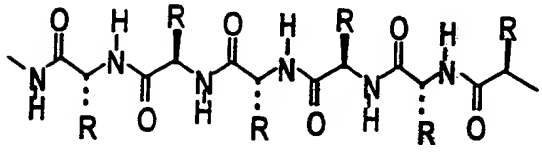
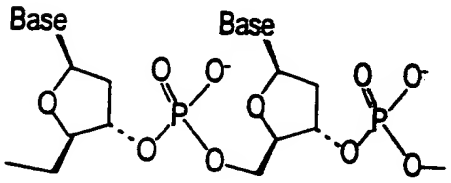

HO
O
OH
OH
OH
OH
=
520

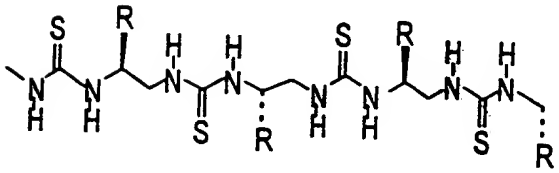
FIG. 9



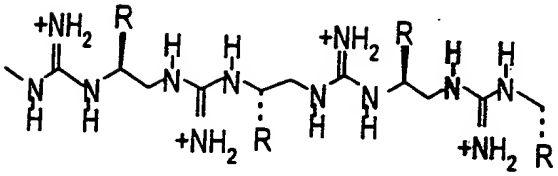
Peptides



Nucleotides



Polythioureas



Polyguanidiniums

FIG. 10

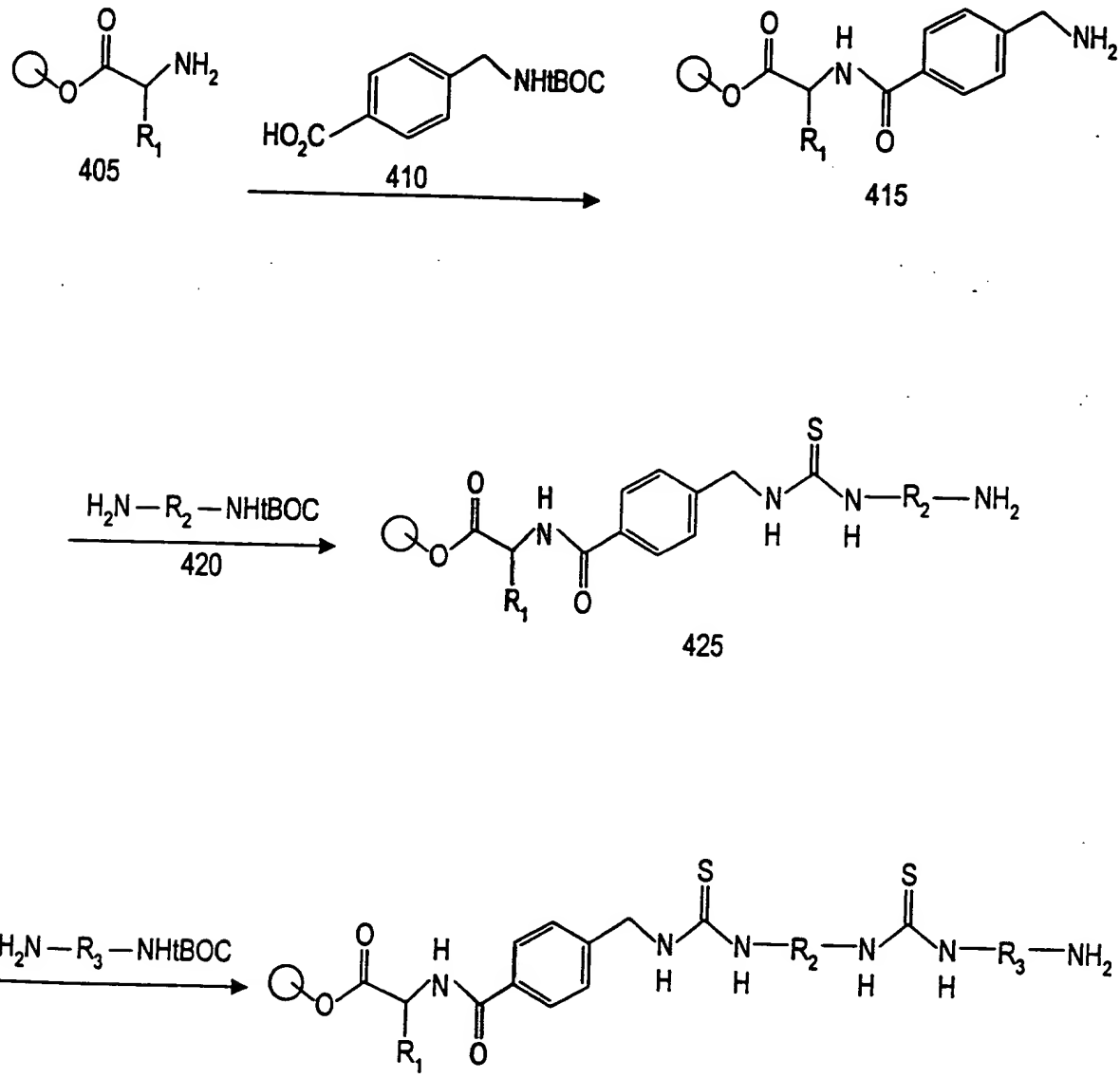


FIG. 11

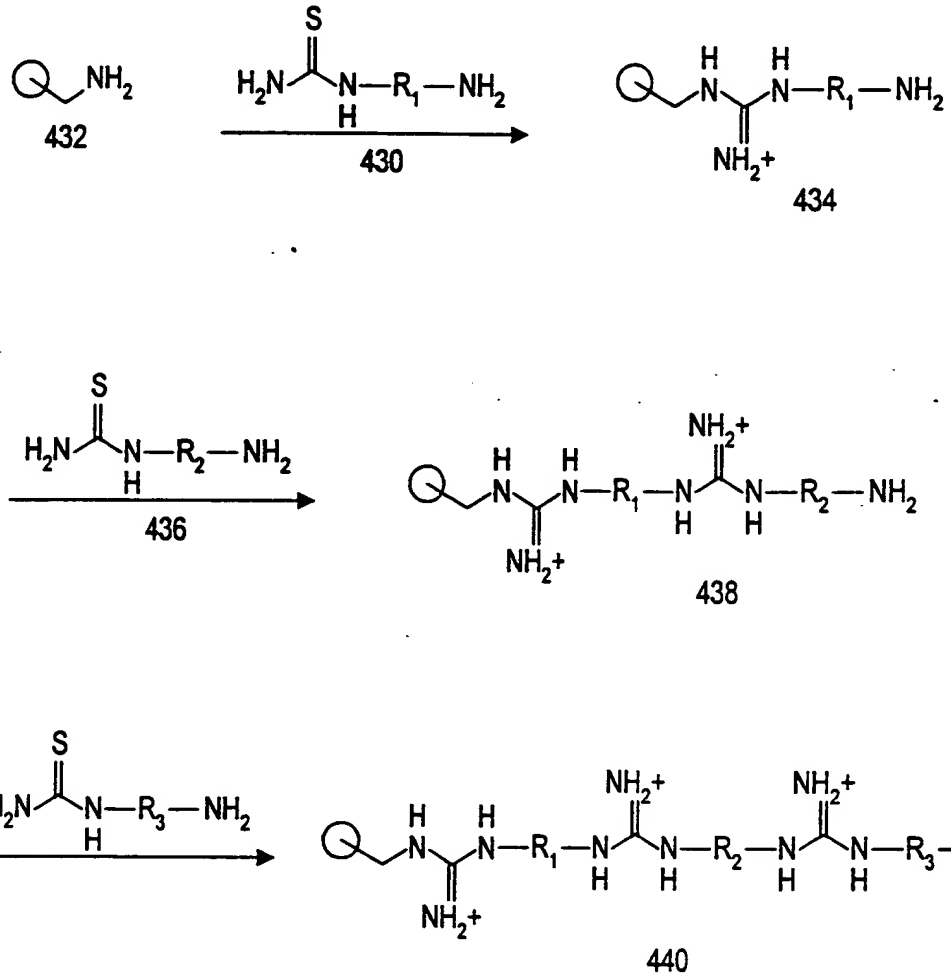


FIG. 12

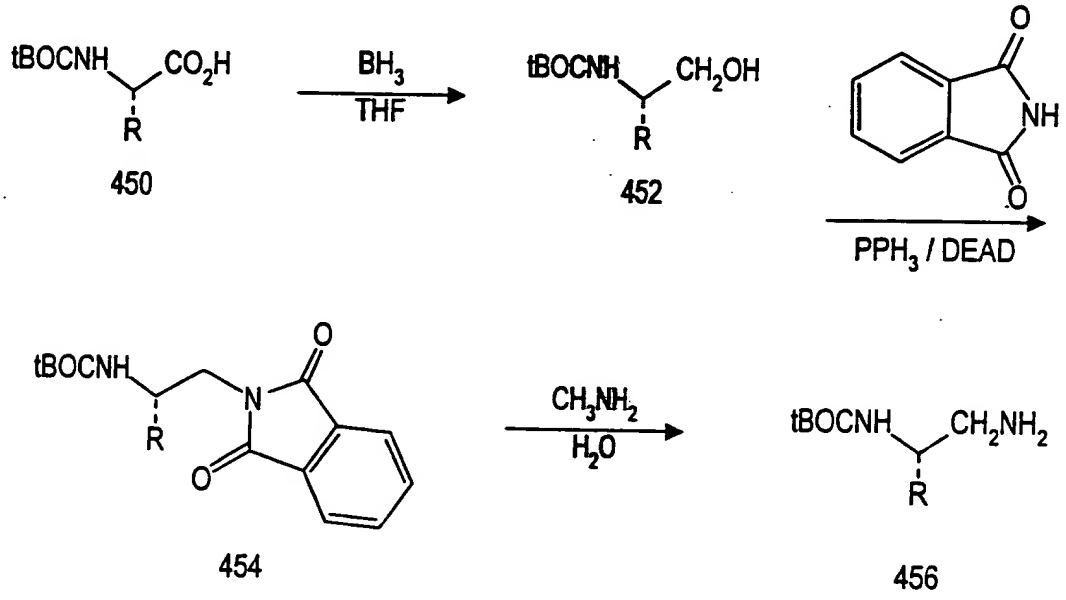
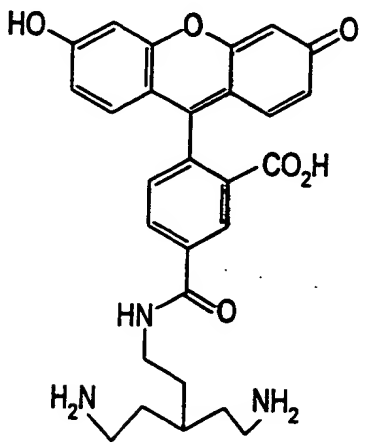
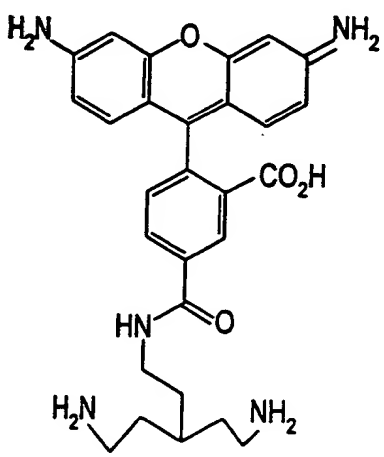


FIG. 13



470



475

FIG. 14

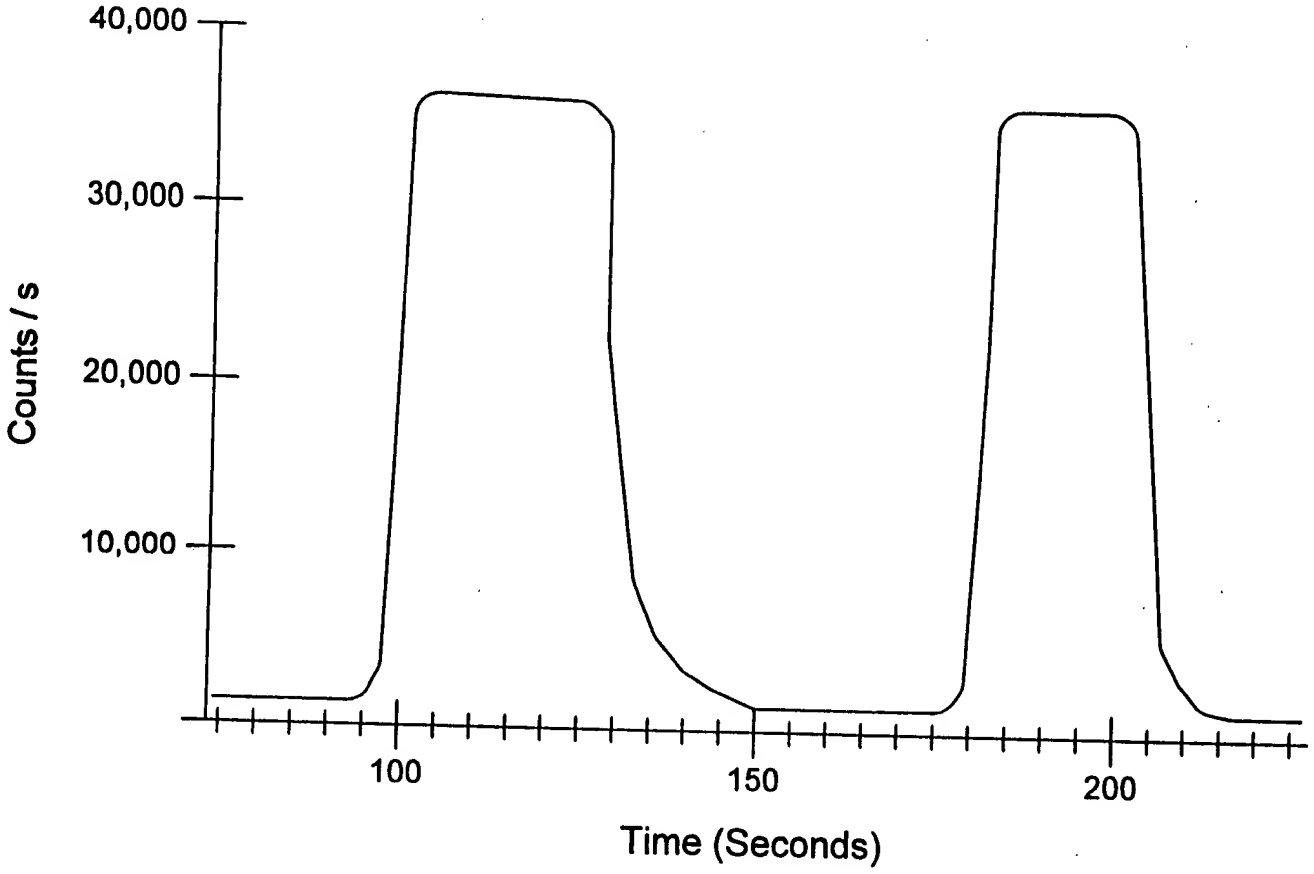


FIG. 15

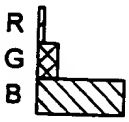
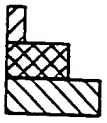
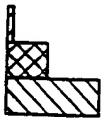
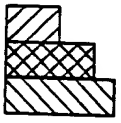
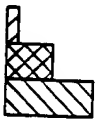
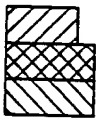
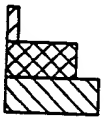
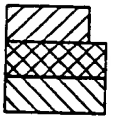
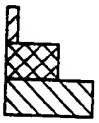
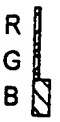
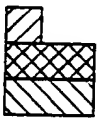
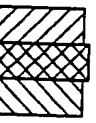
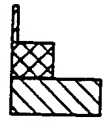
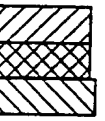
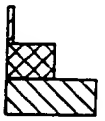
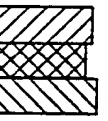
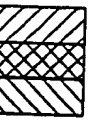
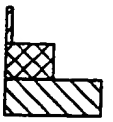
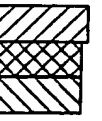
RESIN: pH	Ion	Blank	Alizarin	o-Cresol-phthalein	Fluorescein	Alizarin-Ce^{3+} complex
2	none					
2	Ca^{2+}					
7	none					
7	Ca^{2+}					
7	F^-					
12	none					
12	Ca^{2+}					
12	F^-					

FIG. 16

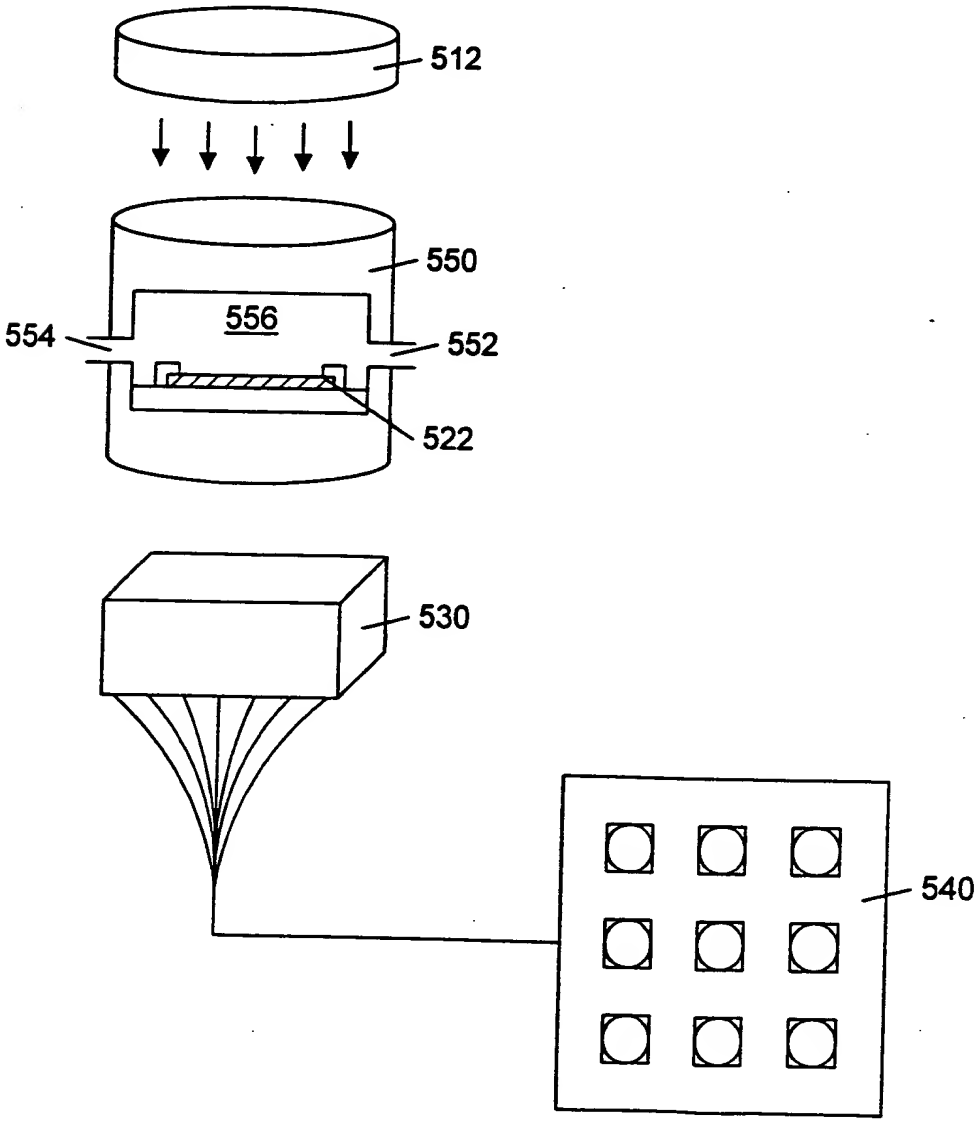


FIG. 17

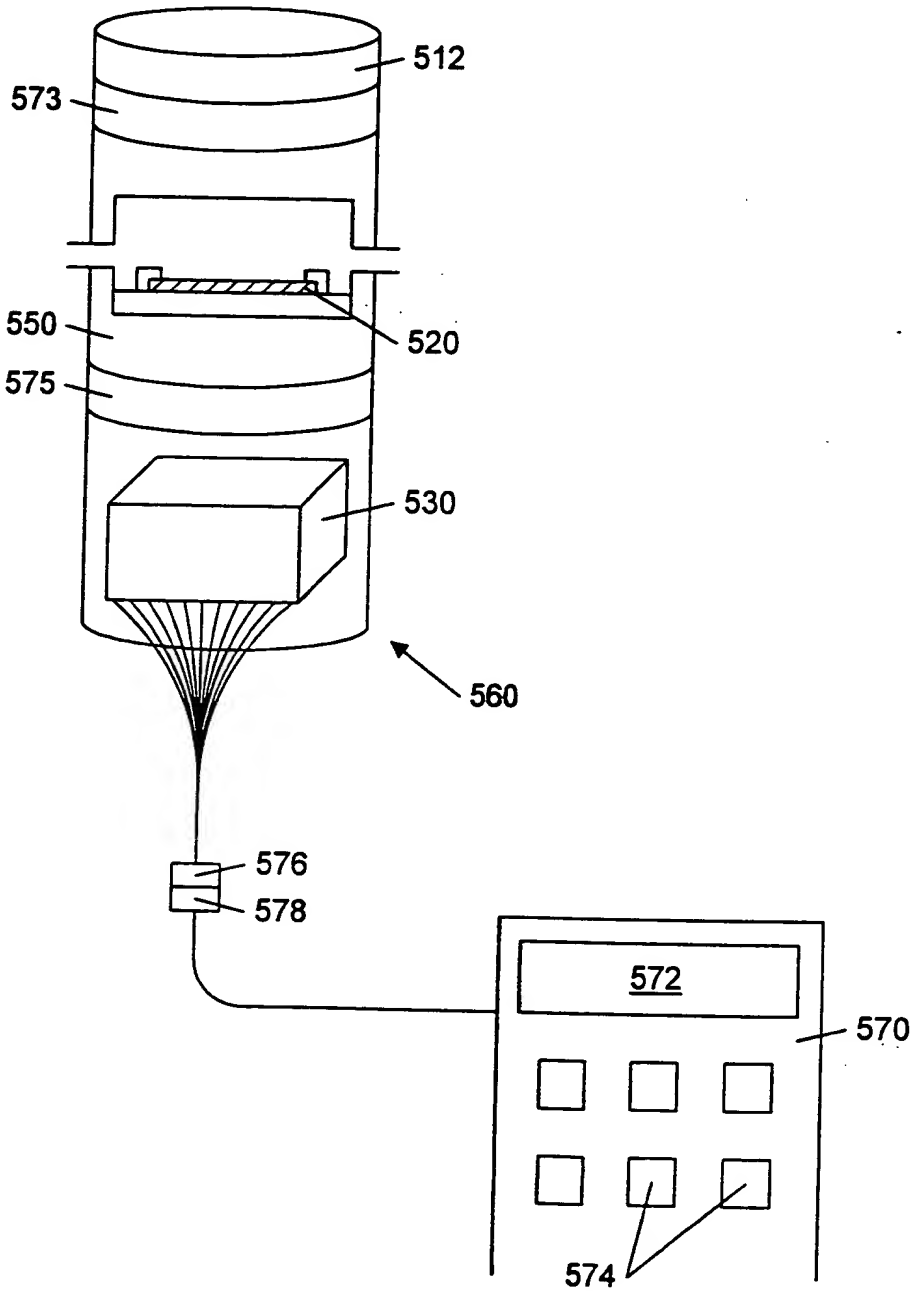


FIG. 18

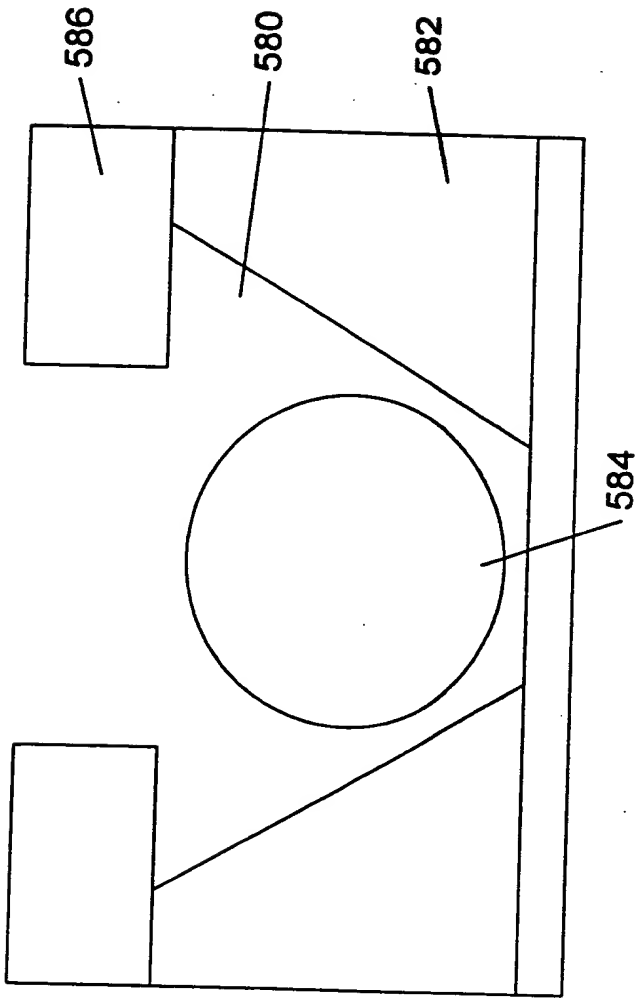


FIG. 19

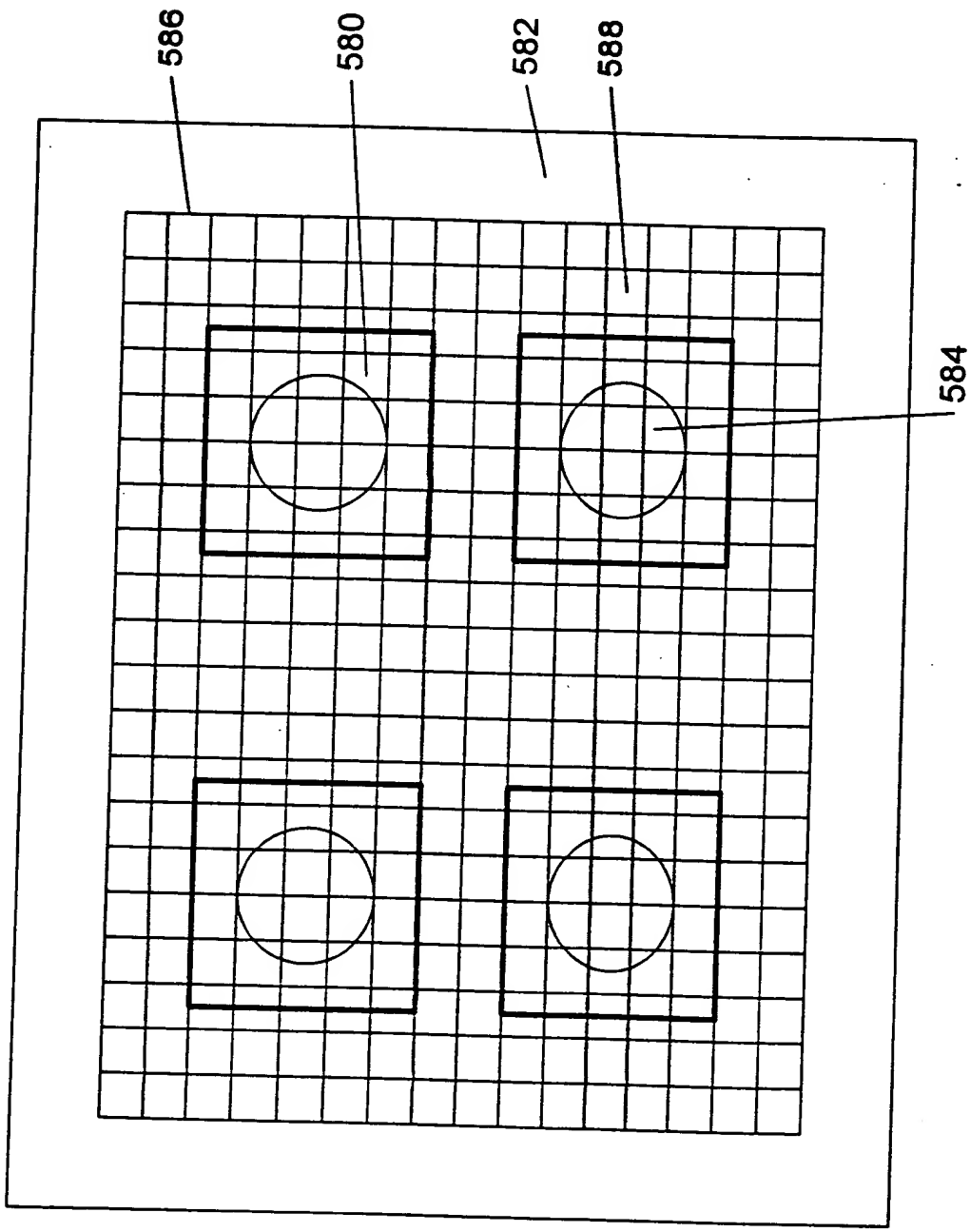


FIG. 20

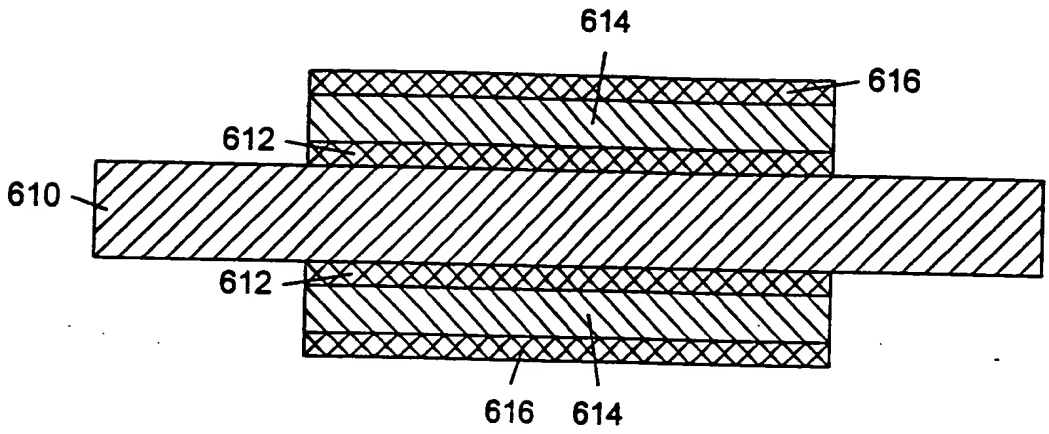


FIG. 21A

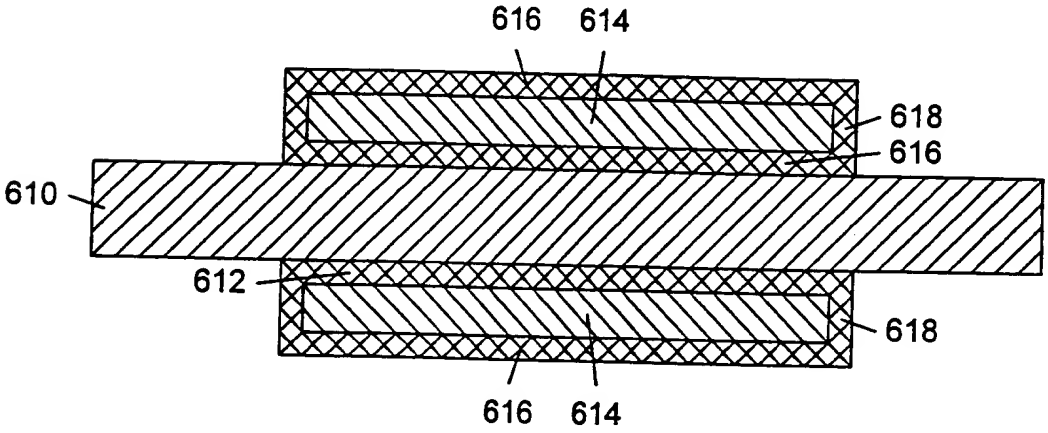


FIG. 21B

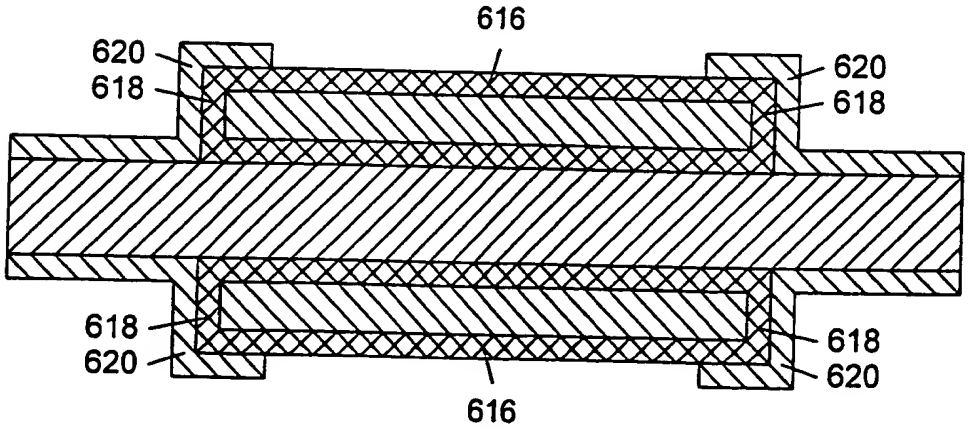


FIG. 21C

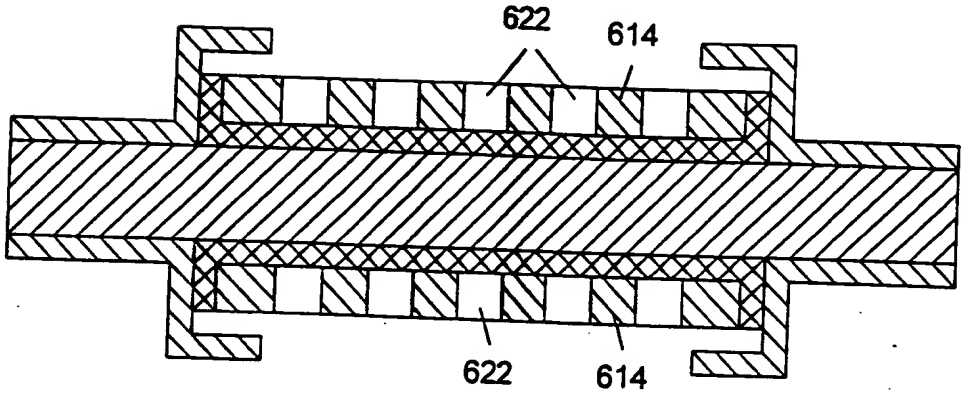


FIG. 21D

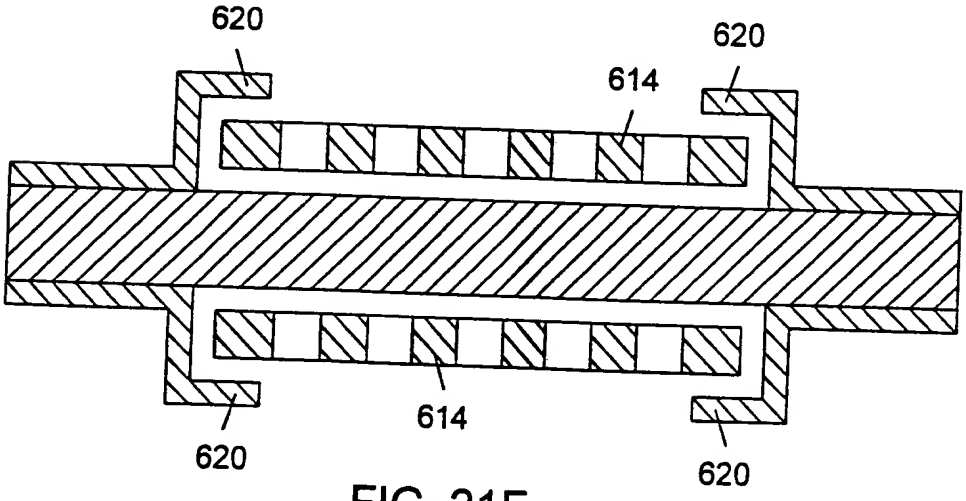


FIG. 21E

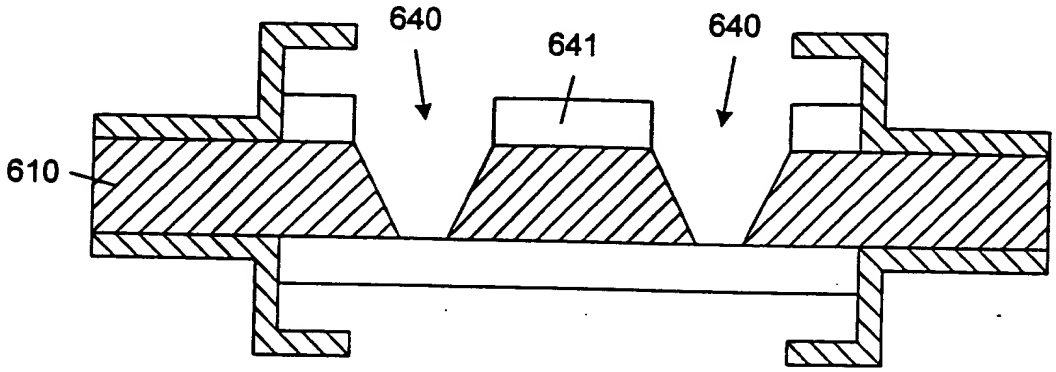


FIG. 21F

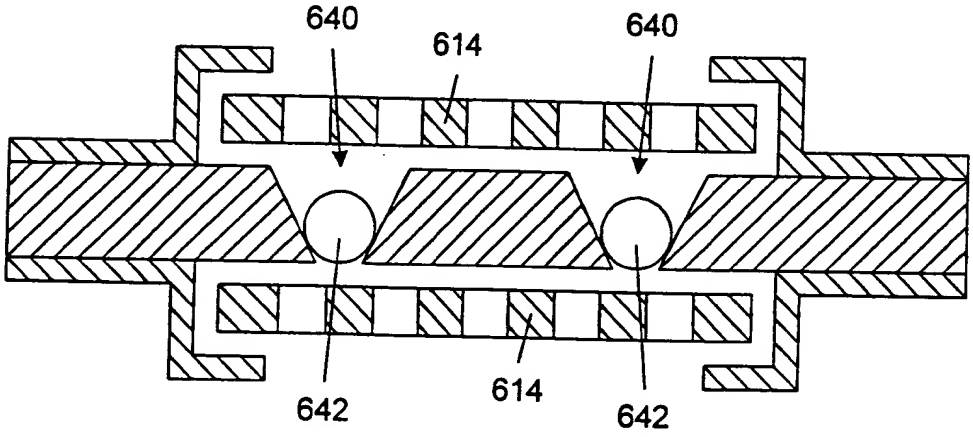


FIG. 21G

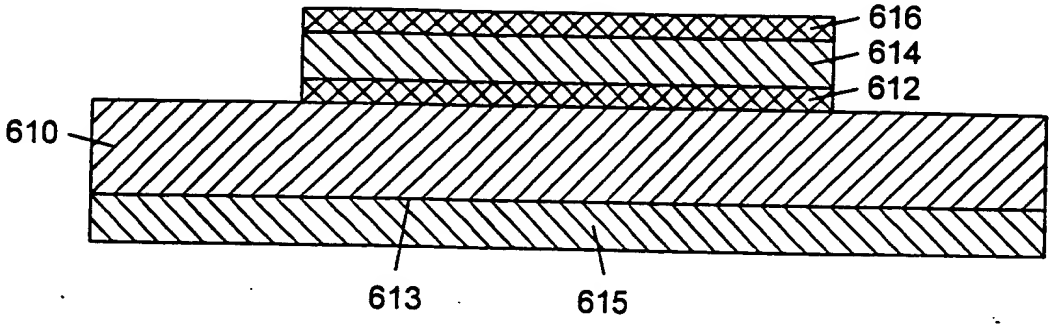


FIG. 22A

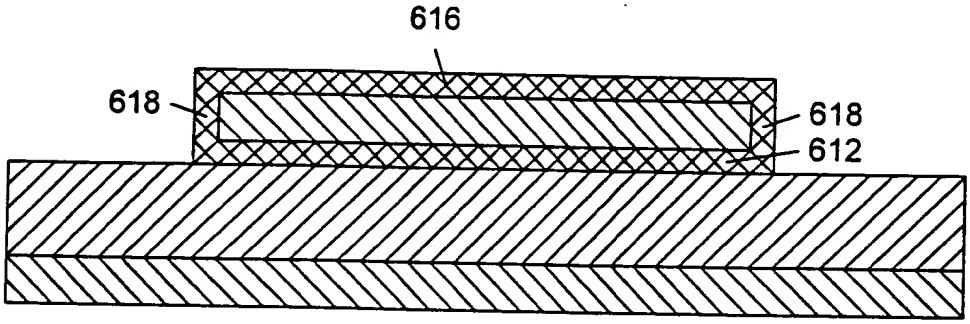


FIG. 22B

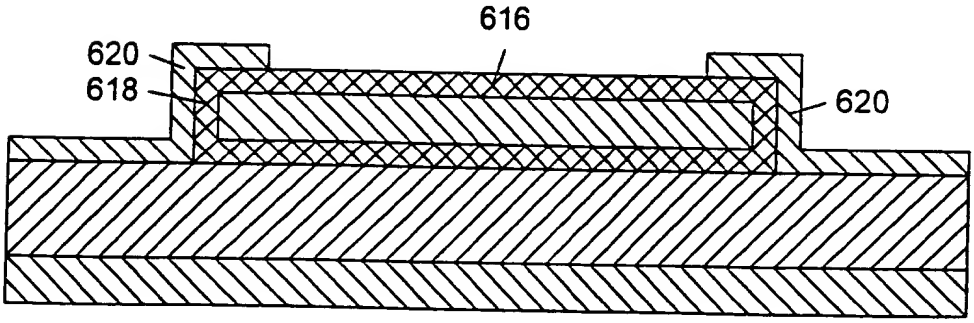


FIG. 22C

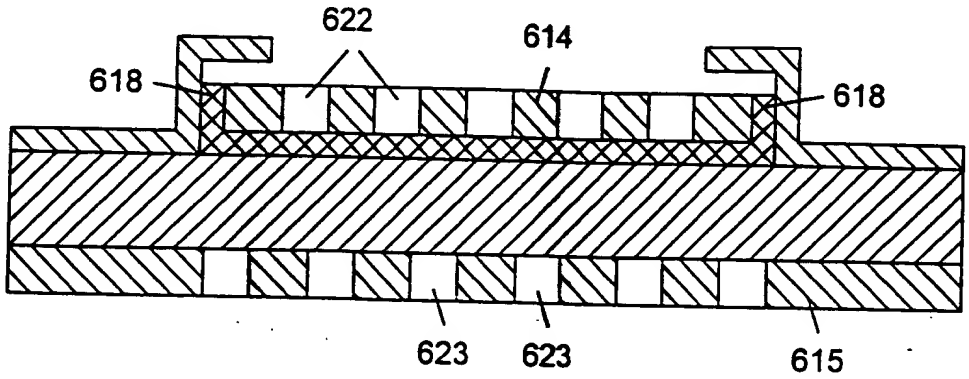


FIG. 22D

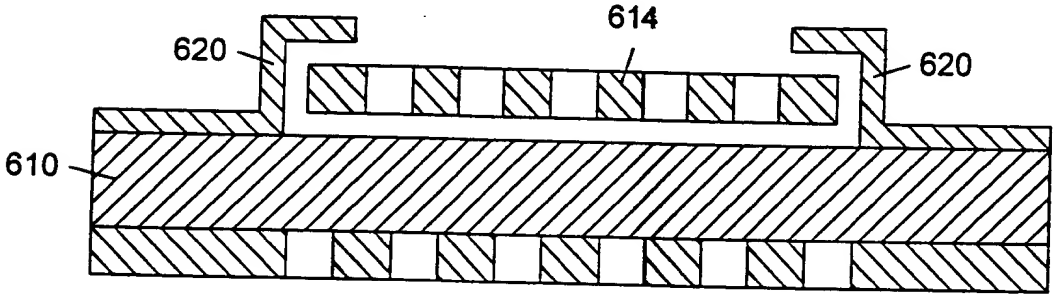


FIG. 22E

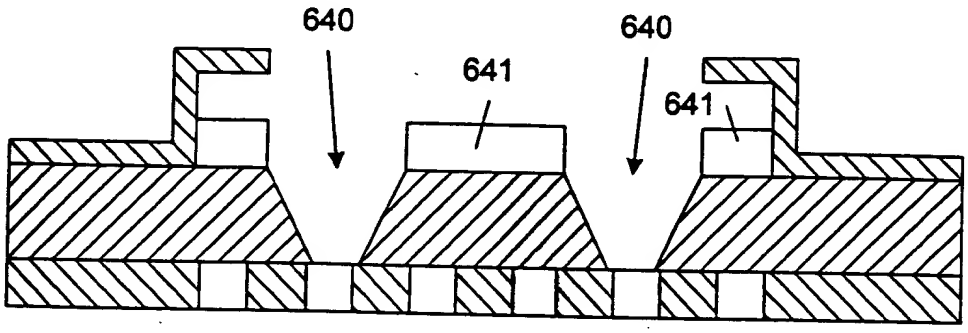


FIG. 22F

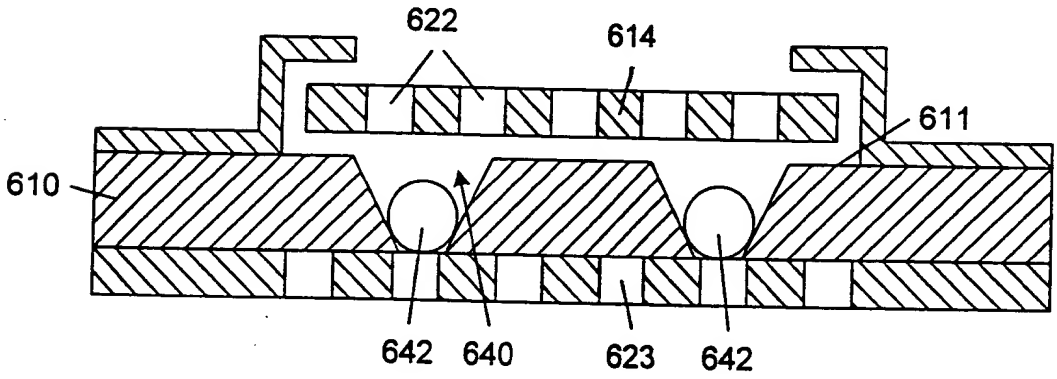


FIG. 22G

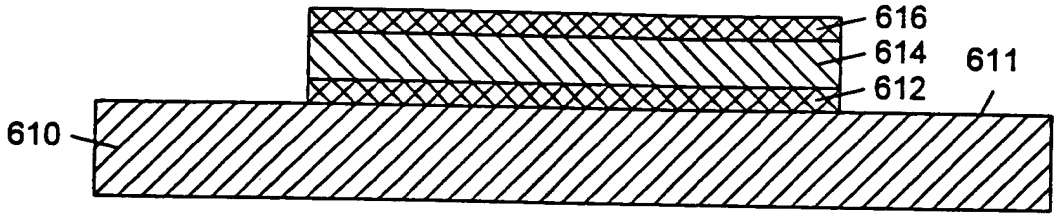


FIG. 23A

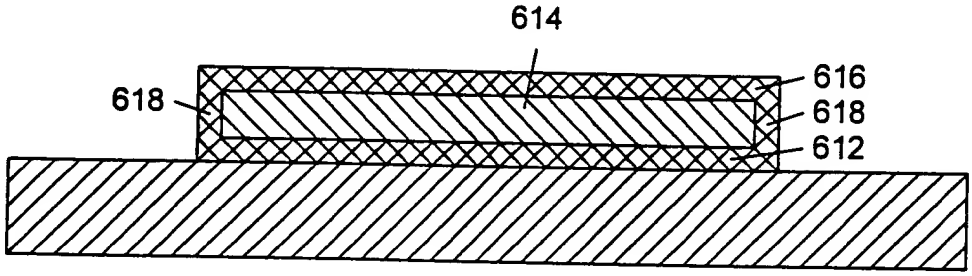


FIG. 23B

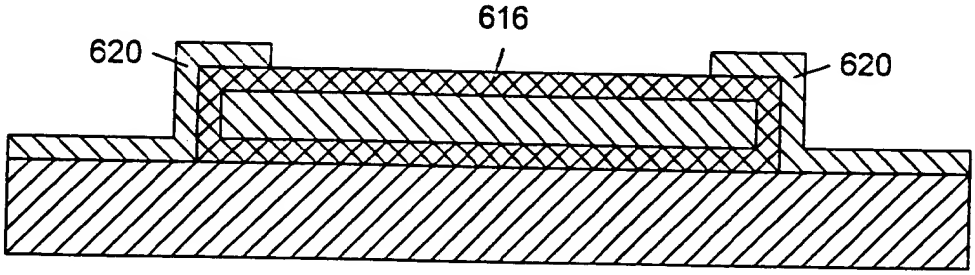


FIG. 23C

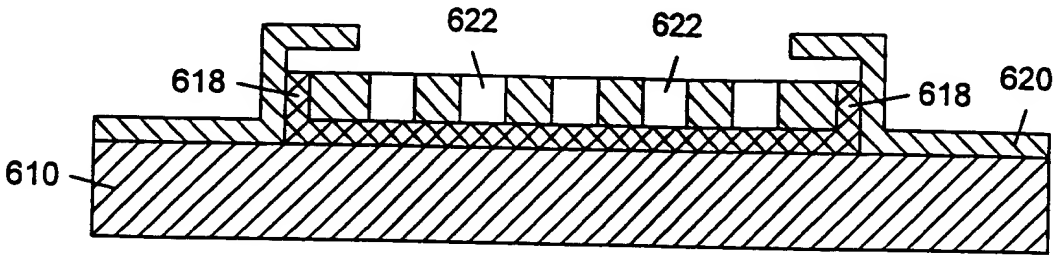


FIG. 23D

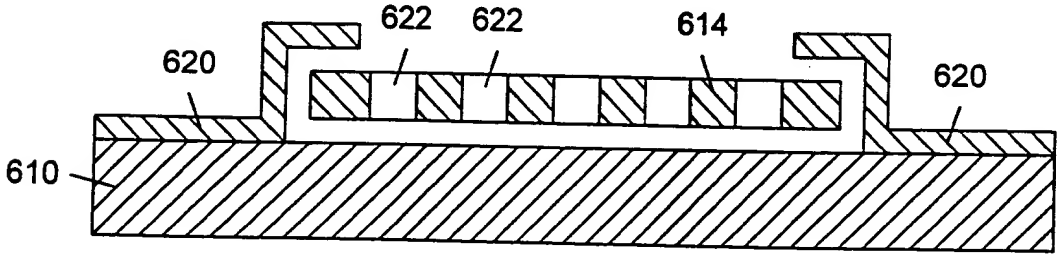


FIG. 23E

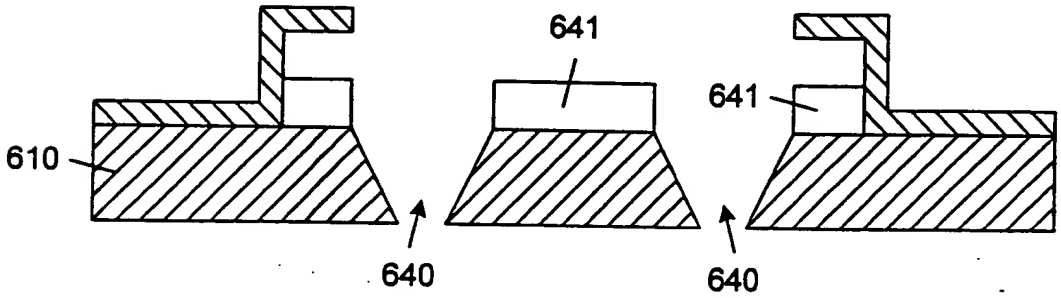


FIG. 23F

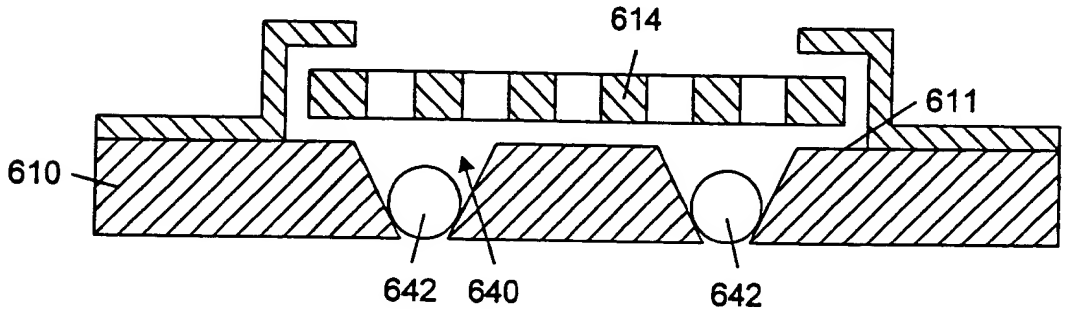


FIG. 23G

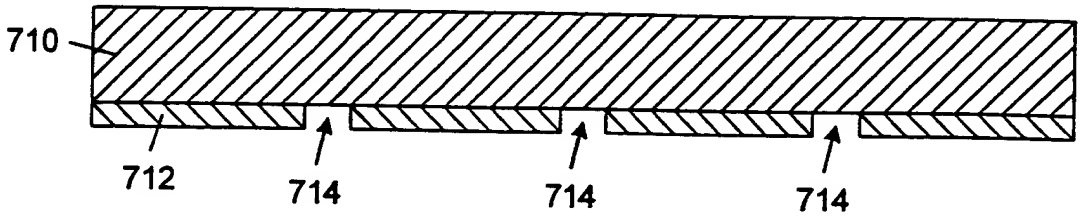


FIG. 24A

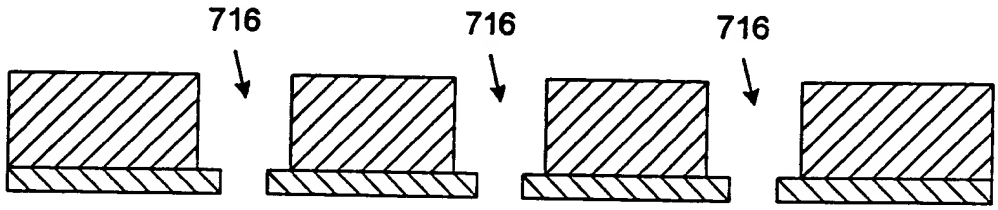


FIG. 24B

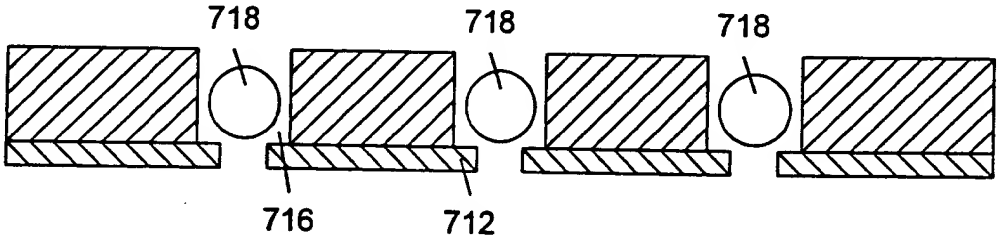


FIG. 24C

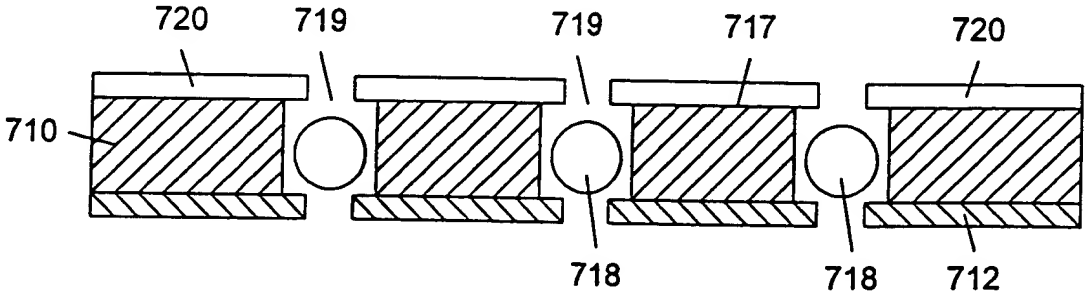


FIG. 24D

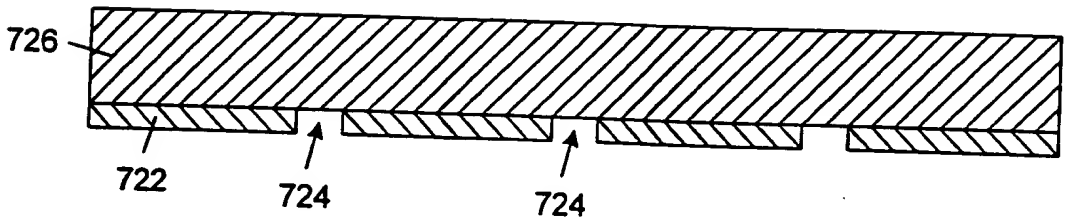


FIG. 25A

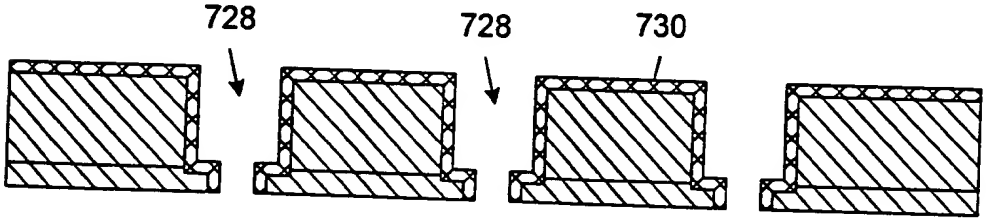


FIG. 25B

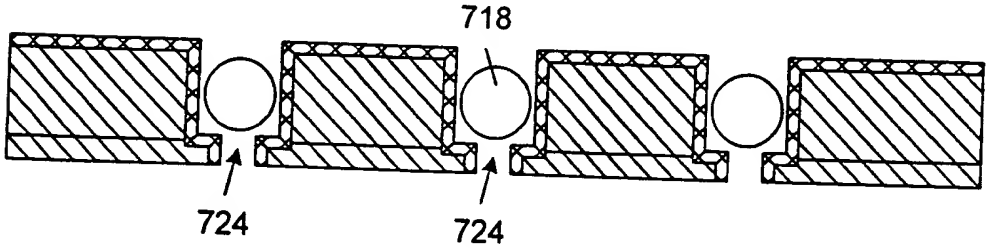


FIG. 25C

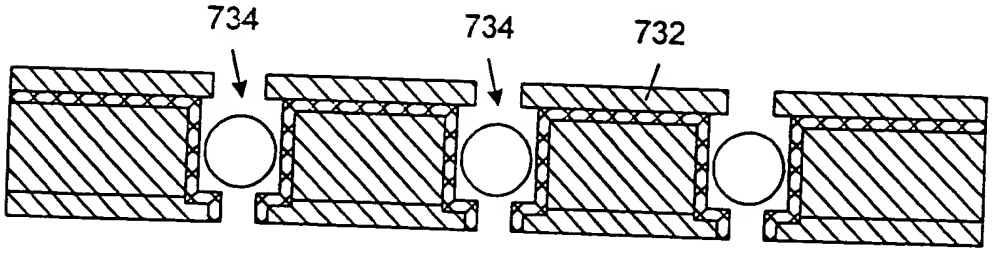


FIG. 25D

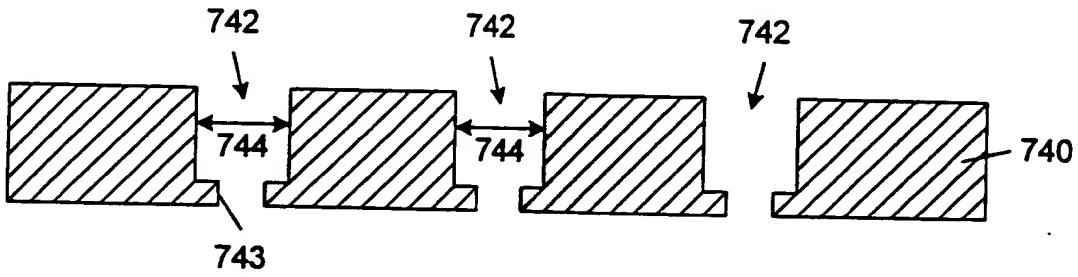


FIG. 26A

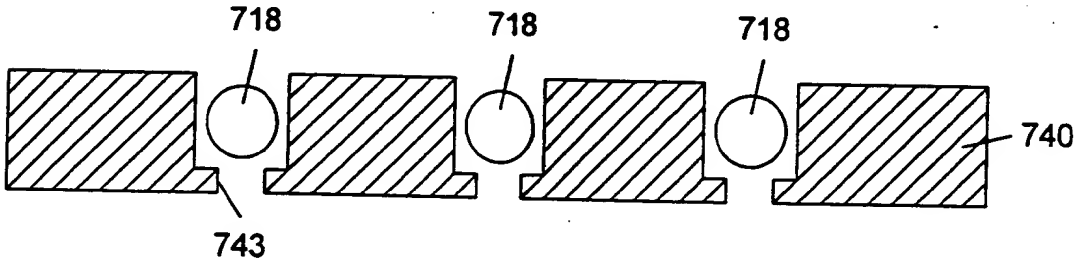


FIG. 26B

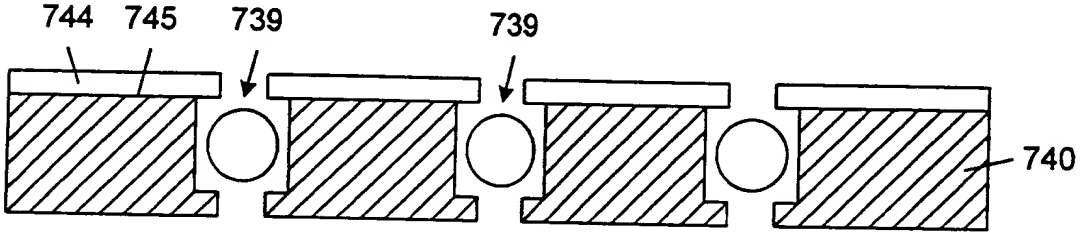


FIG. 26C

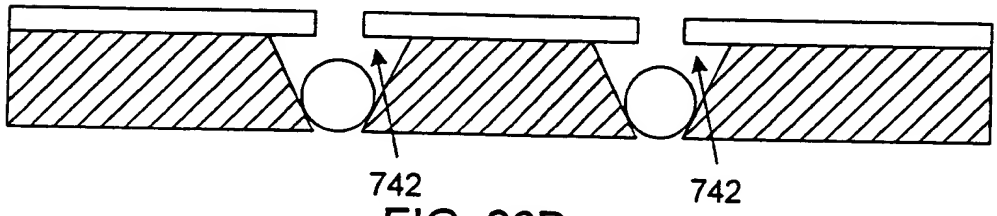


FIG. 26D

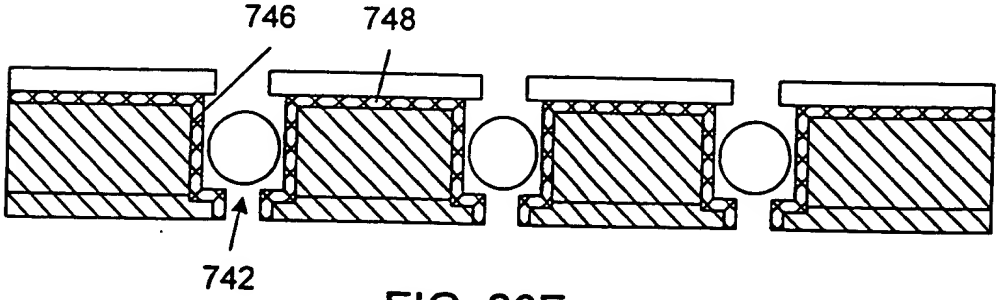


FIG. 26E

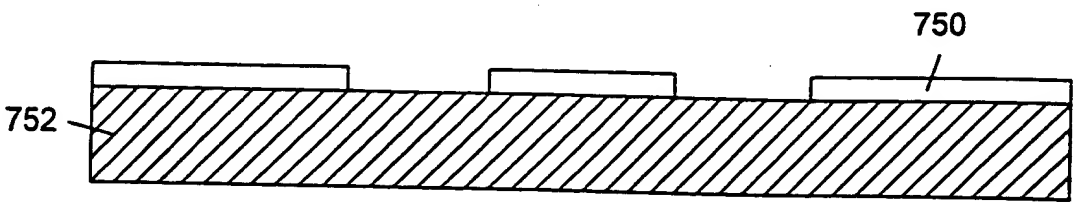


FIG. 27A

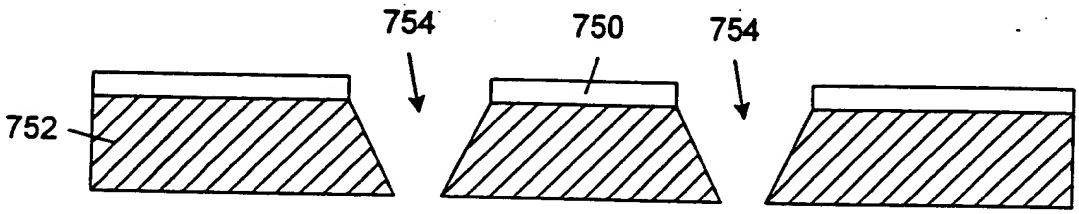


FIG. 27B

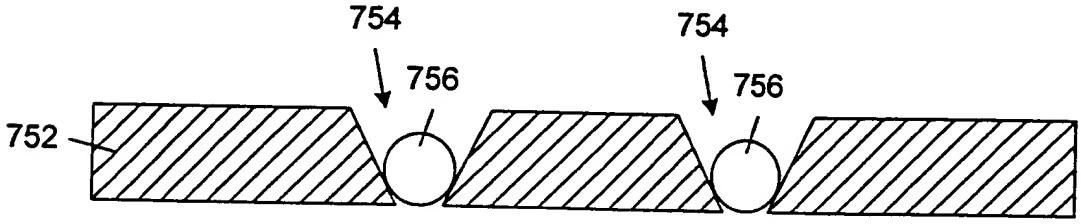


FIG. 27C

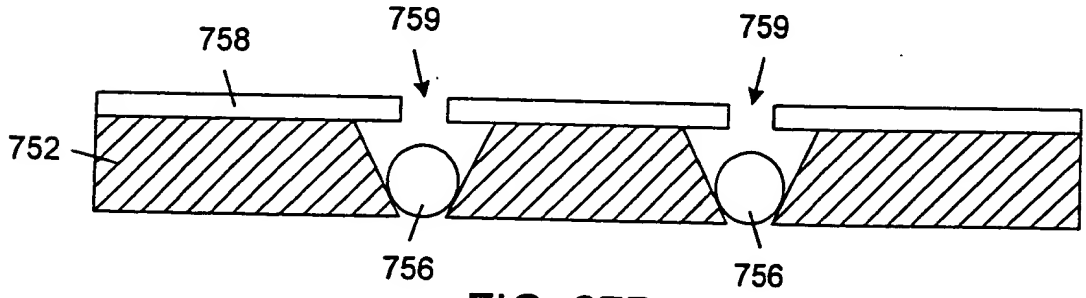


FIG. 27D

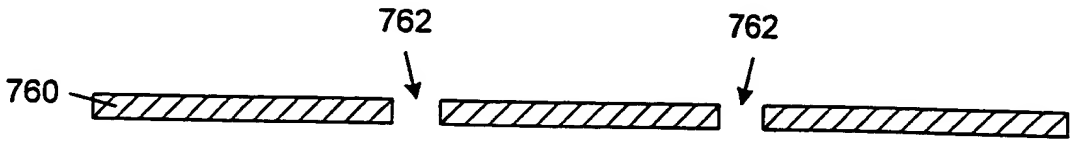


FIG. 28A

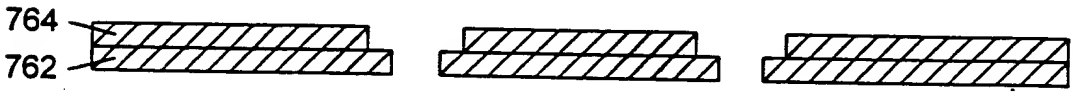


FIG. 28B

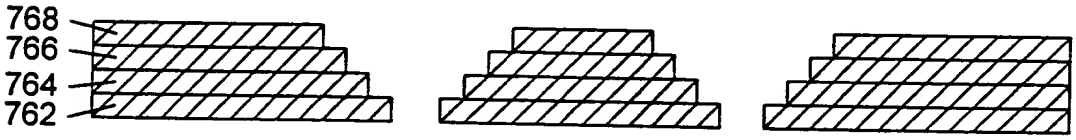


FIG. 28C

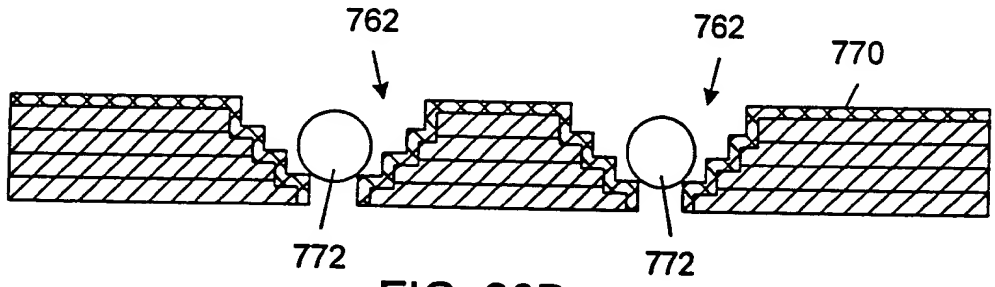


FIG. 28D

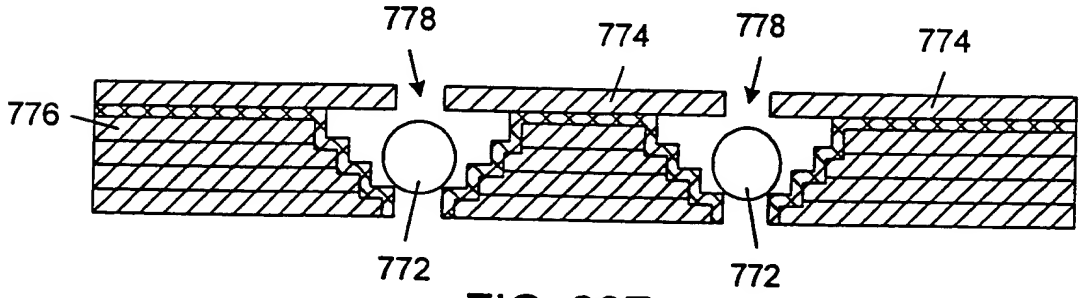


FIG. 28E

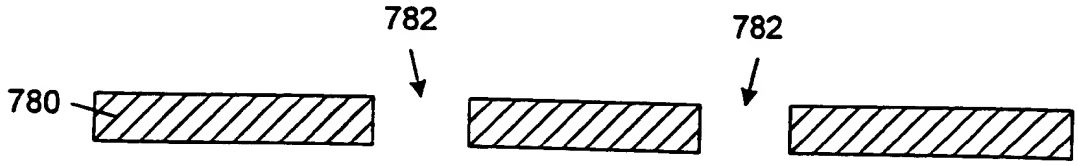


FIG. 29A

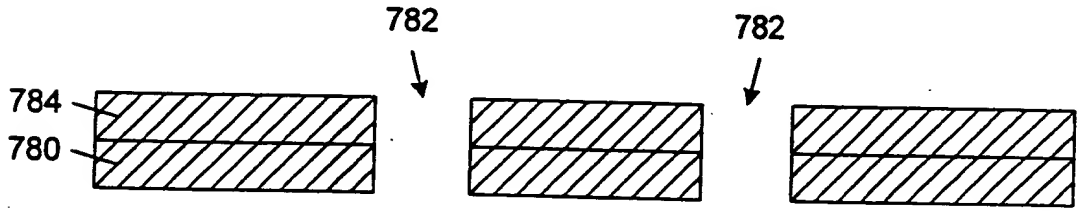


FIG. 29B

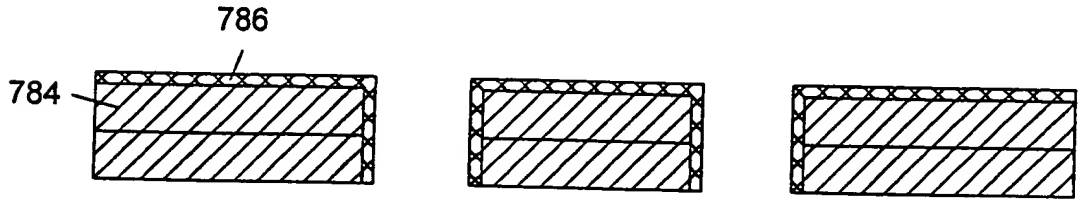


FIG. 29C

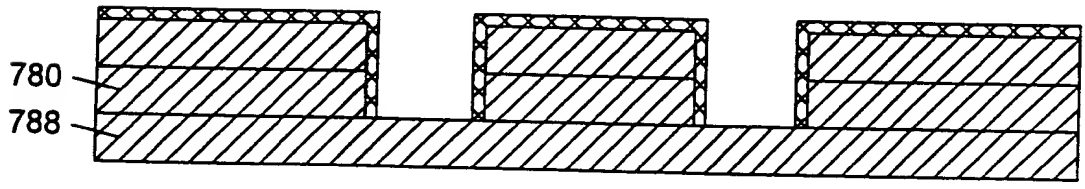


FIG. 29D

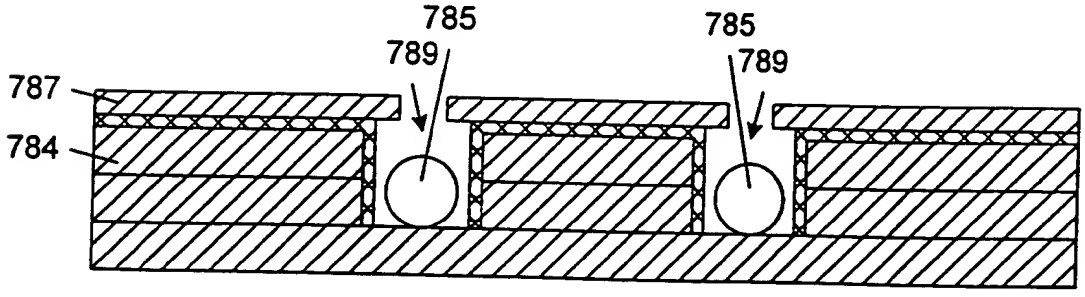


FIG. 29E

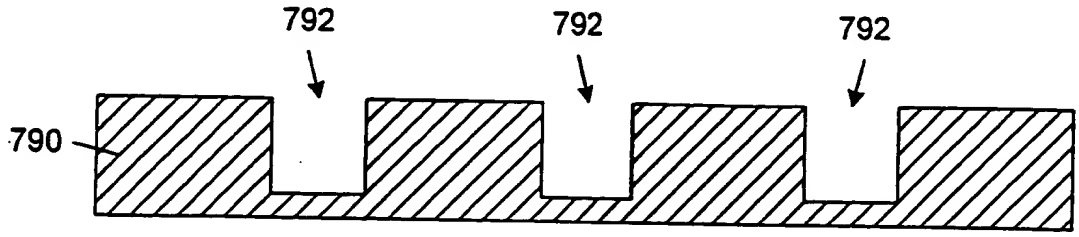


FIG. 30A

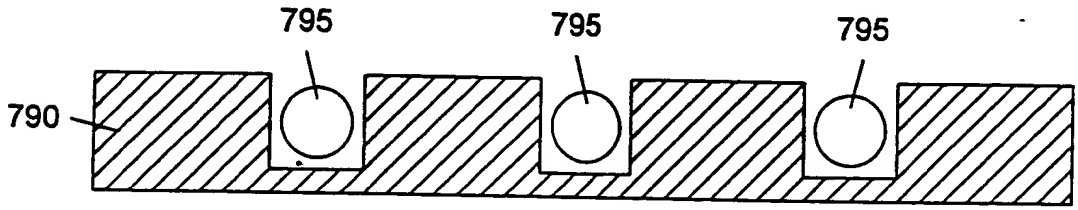


FIG. 30B

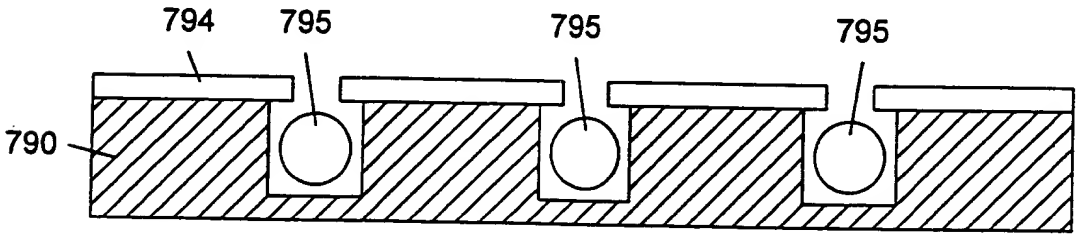


FIG. 30C

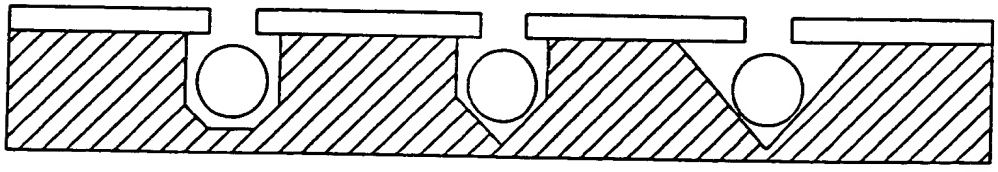


FIG. 30D

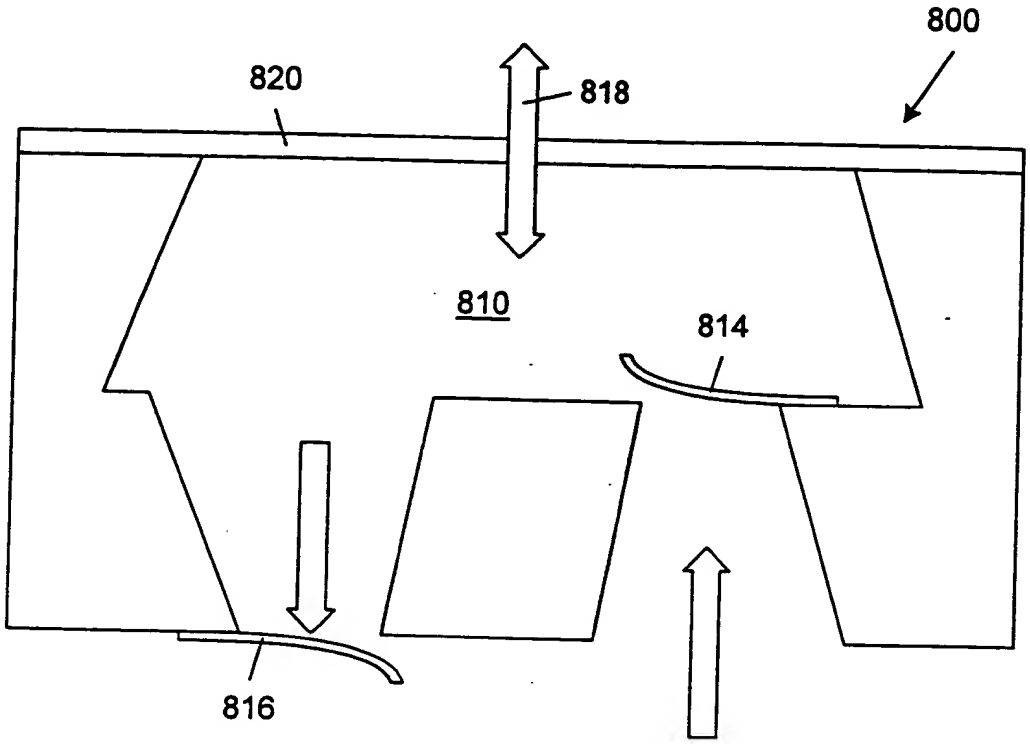


FIG. 31

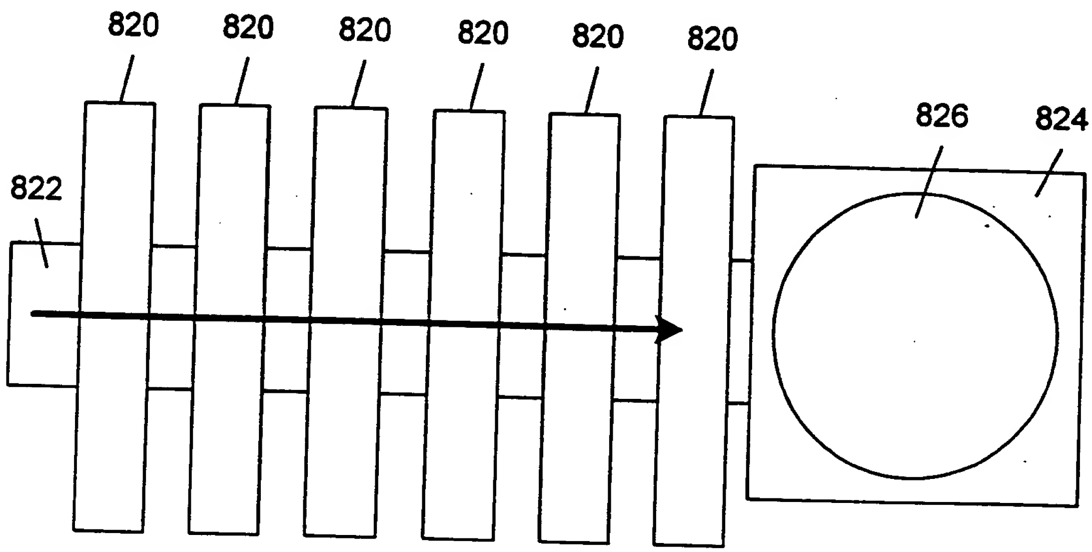


FIG. 32

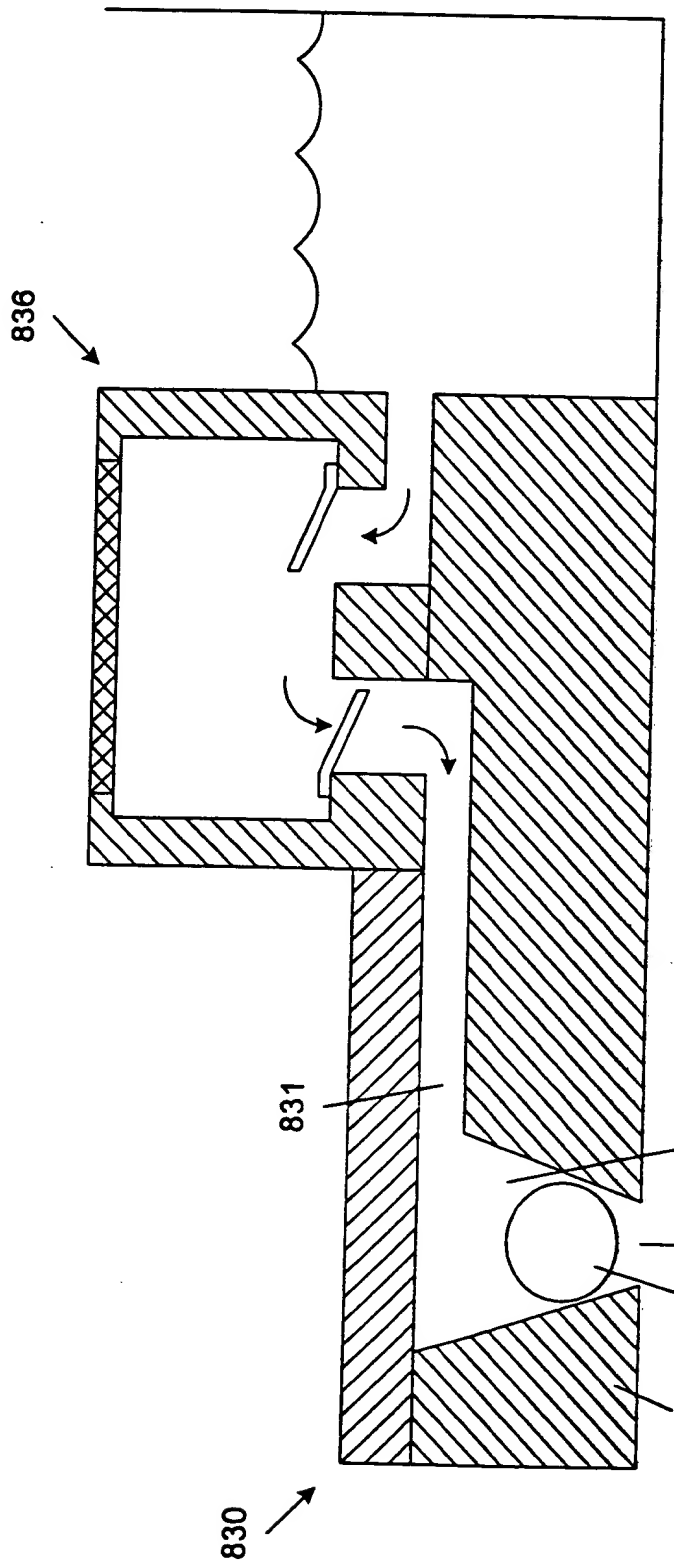


FIG. 33

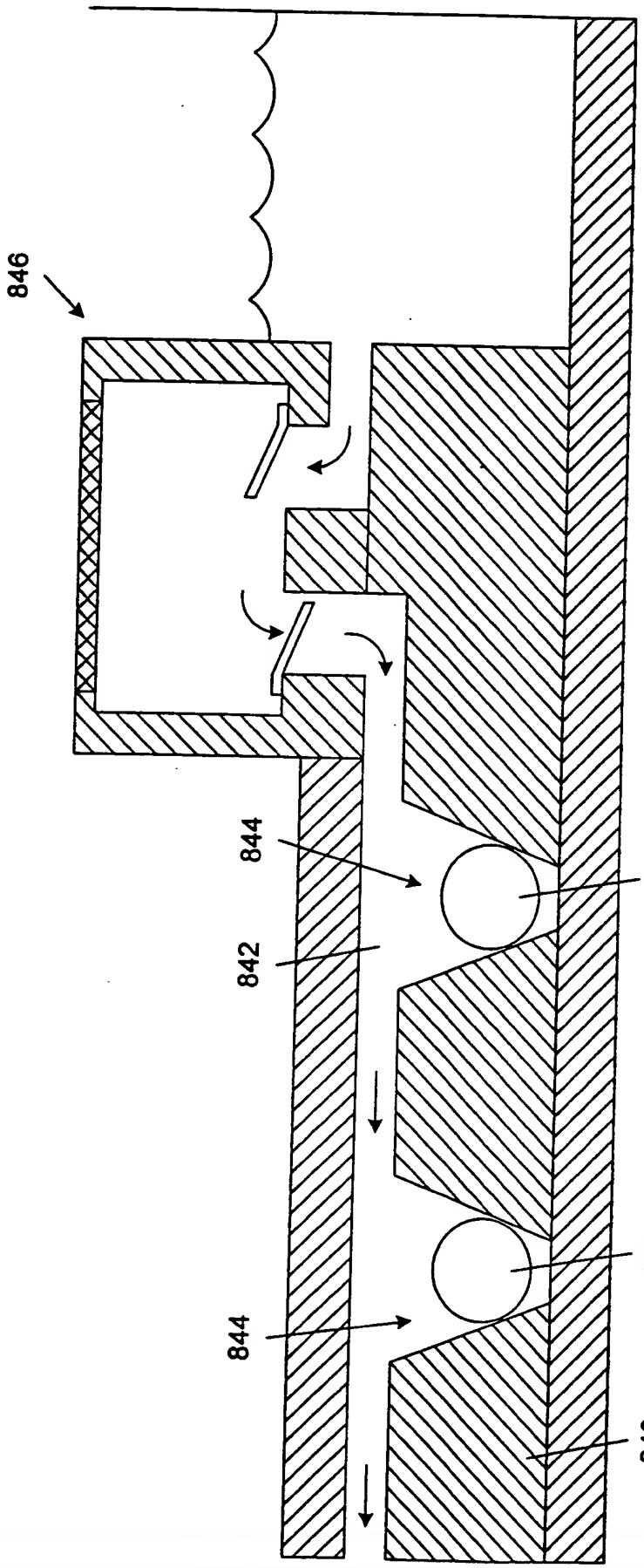


FIG. 34

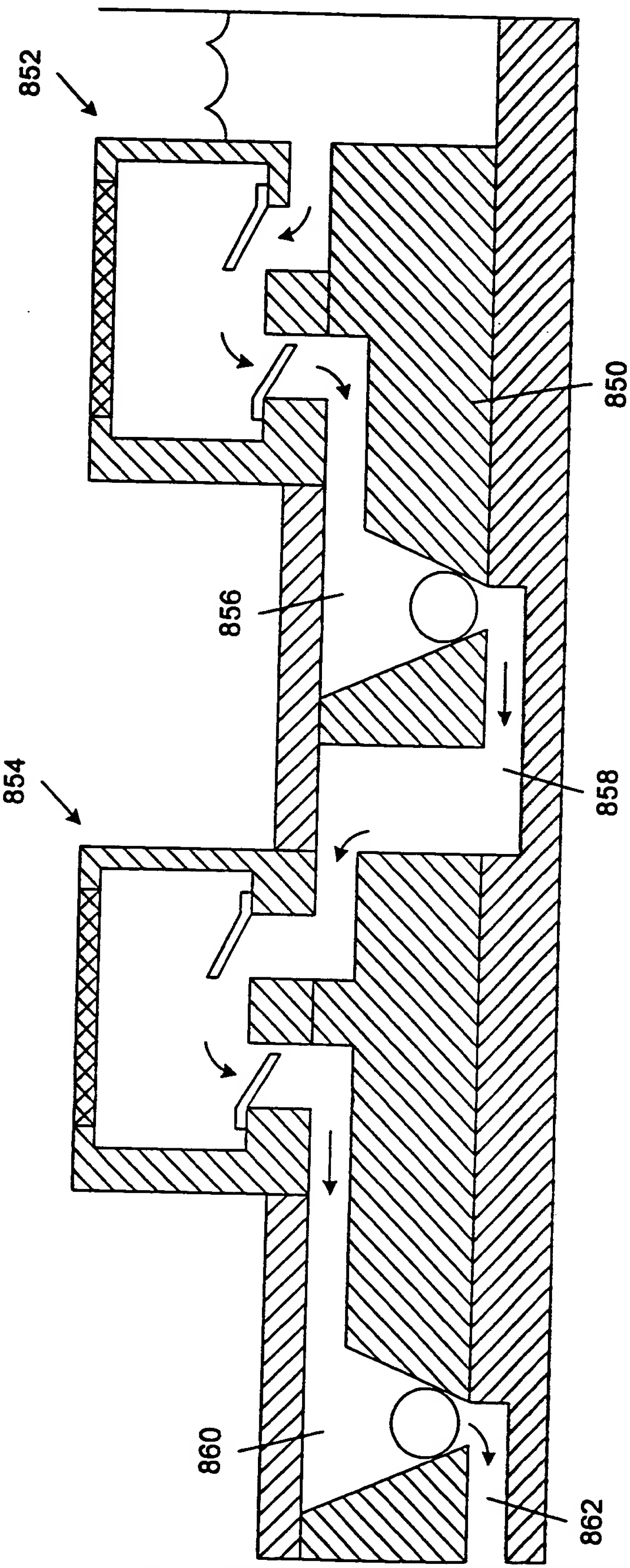


FIG. 35

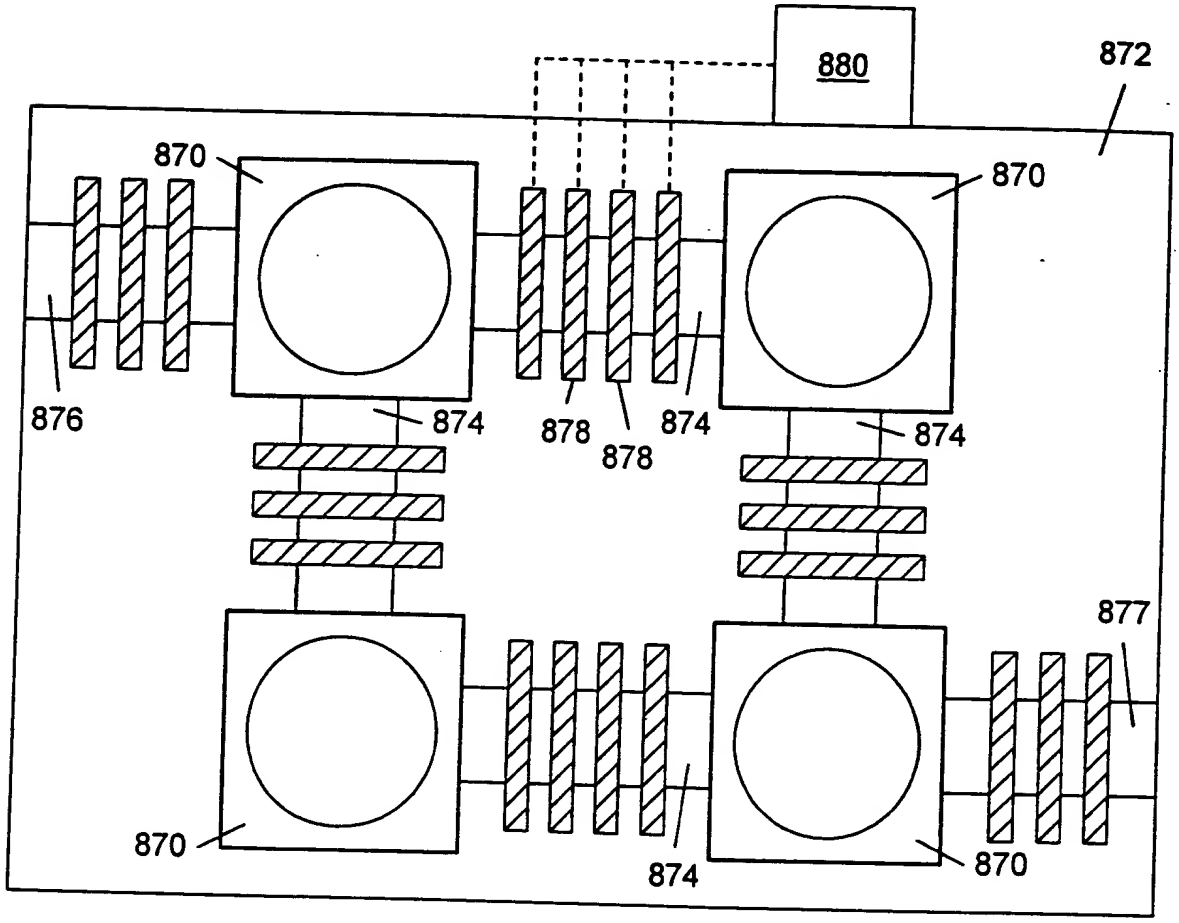


FIG. 36

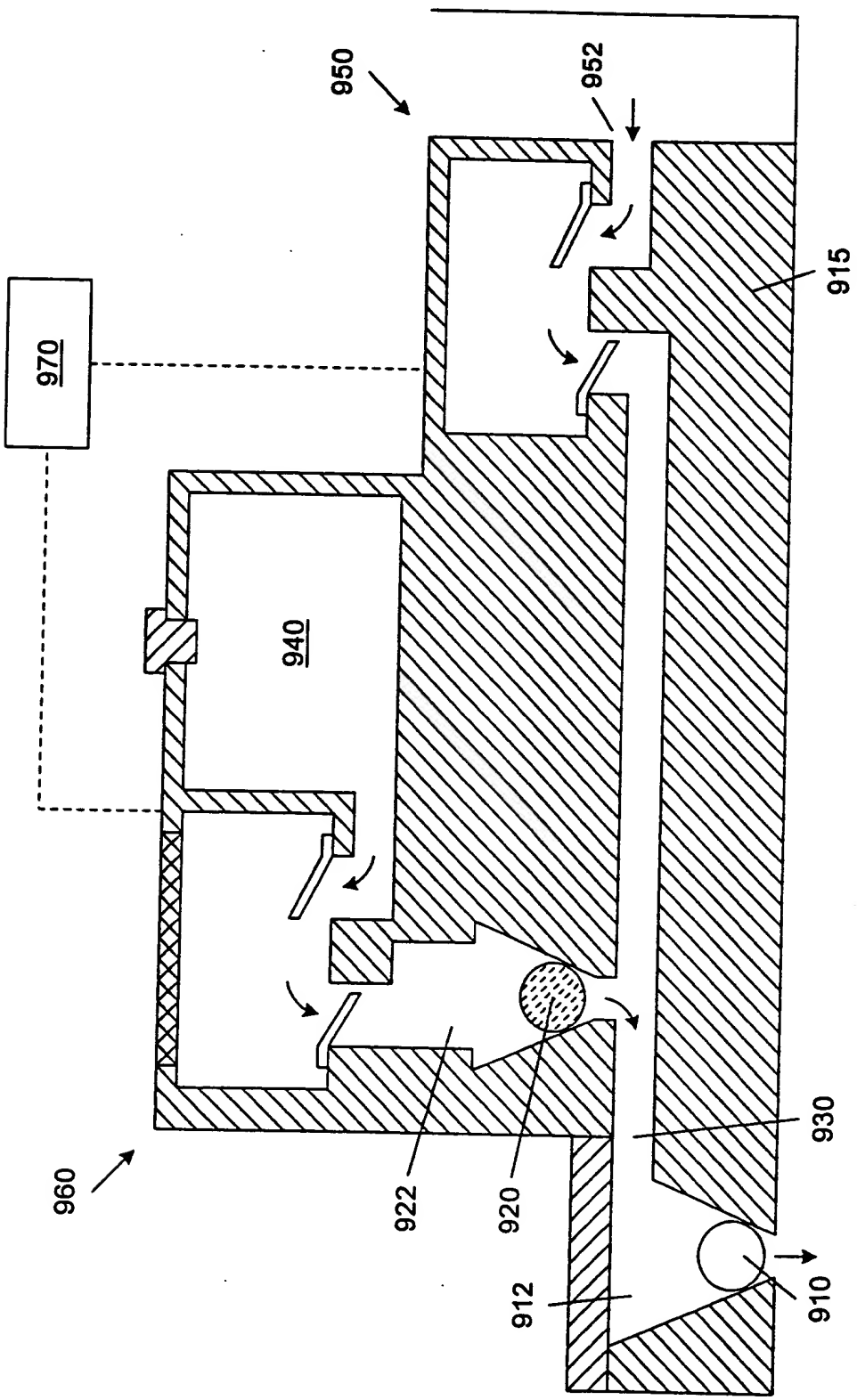


FIG. 37

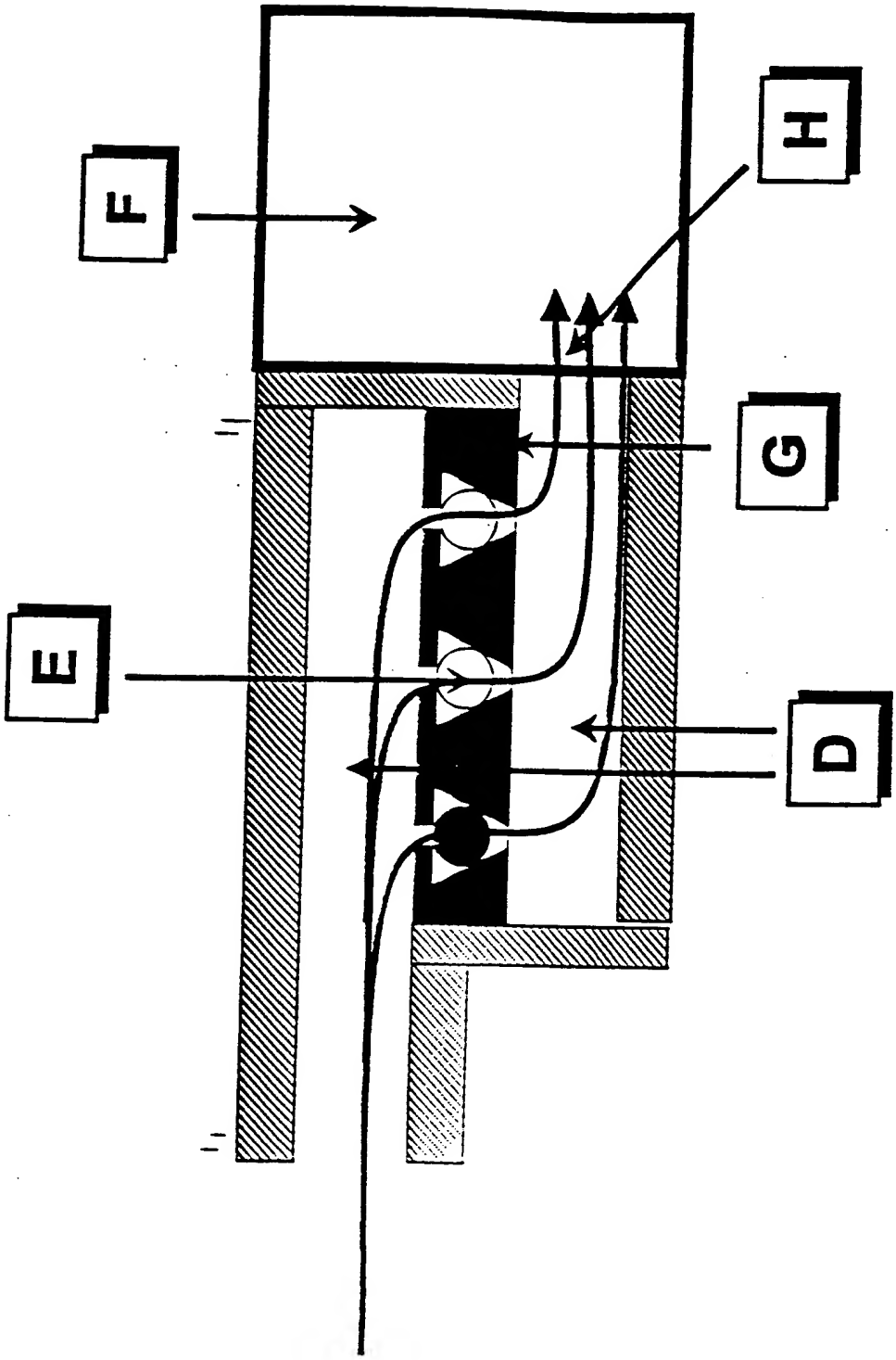


Figure 38

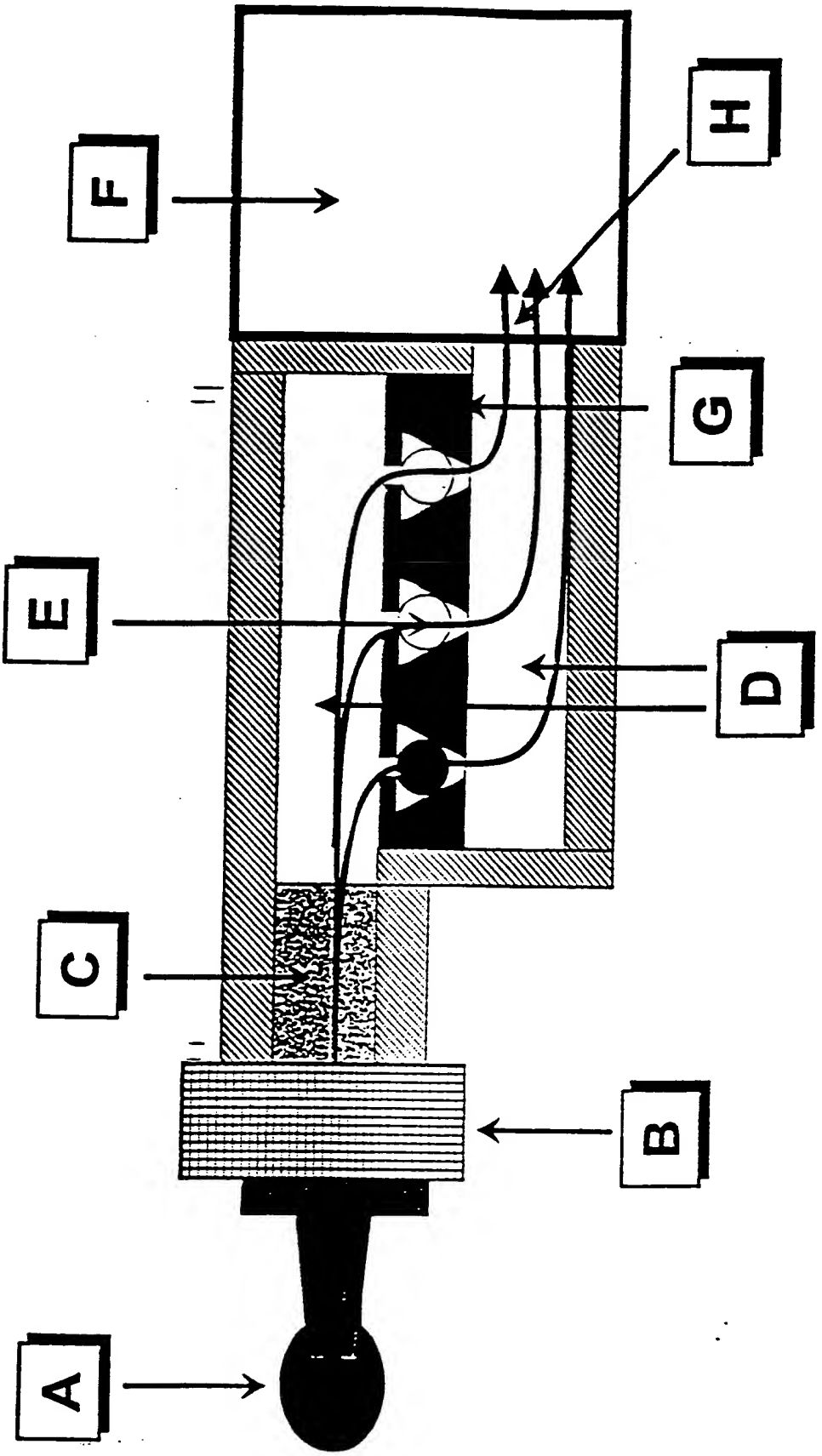


Figure 39

FIG. 40

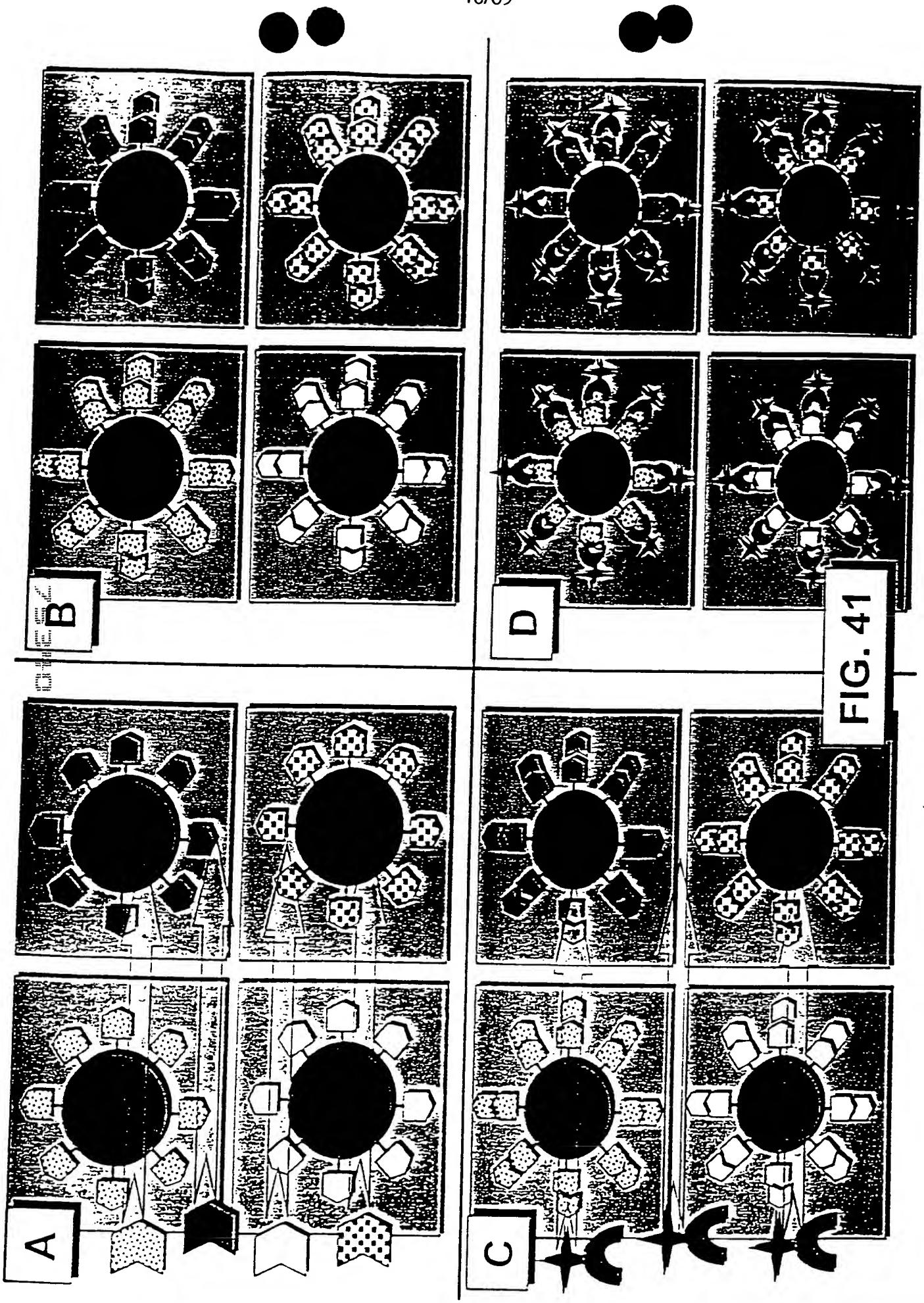


FIG. 41

Electronic Tongue Biological Sample Acquisition Prototype 6/2/99

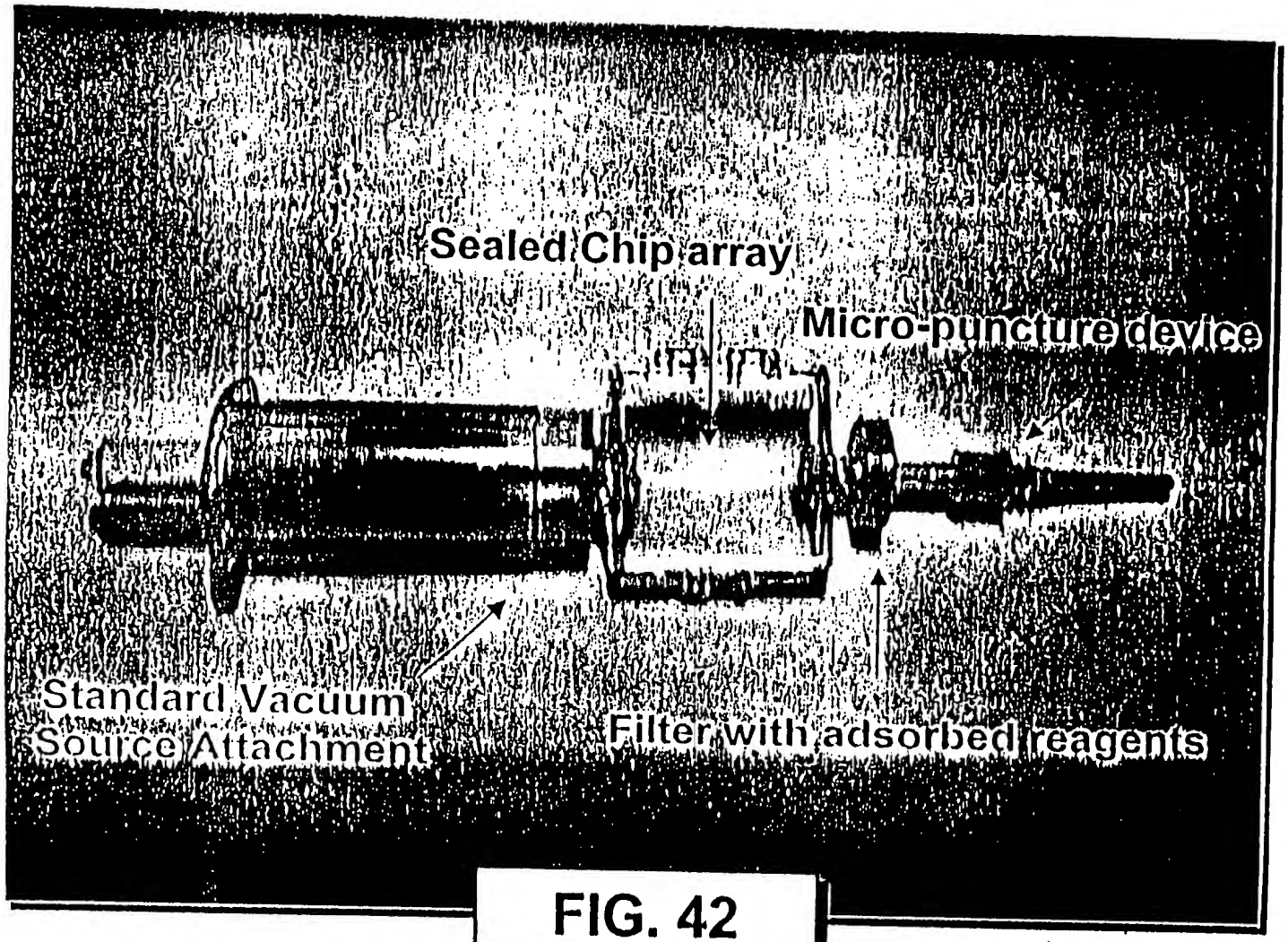


FIG. 42

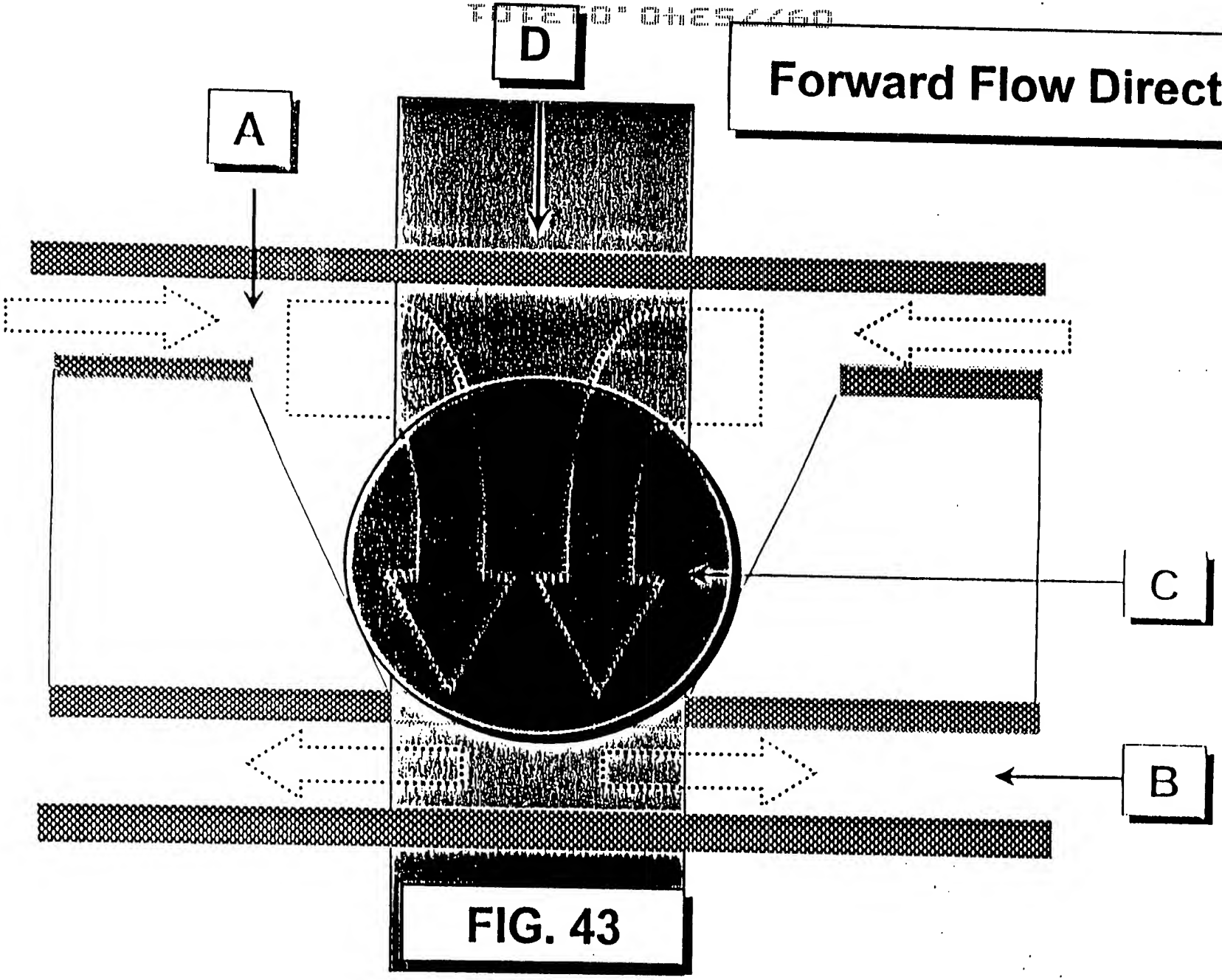


FIG. 43

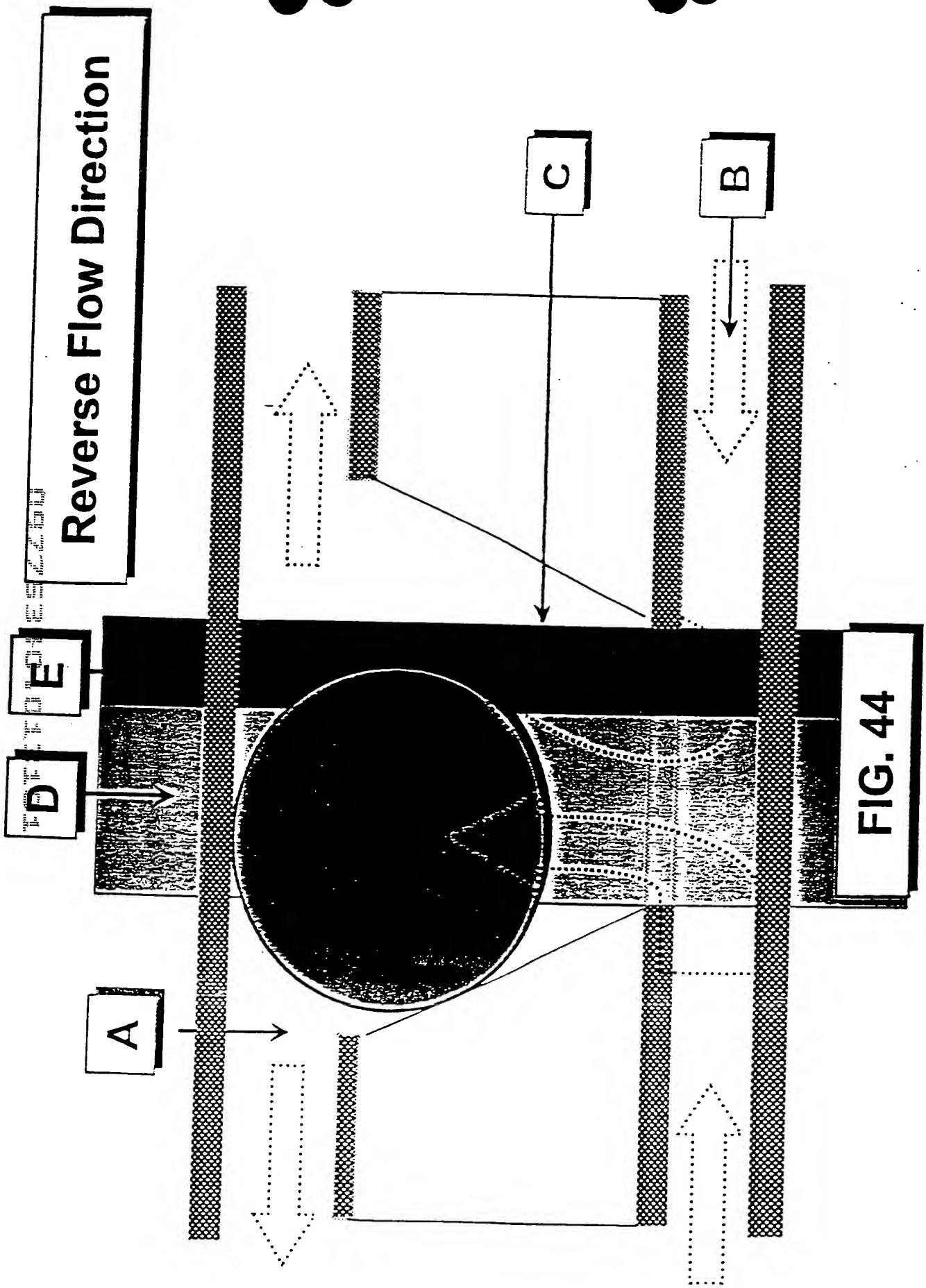


FIG. 44

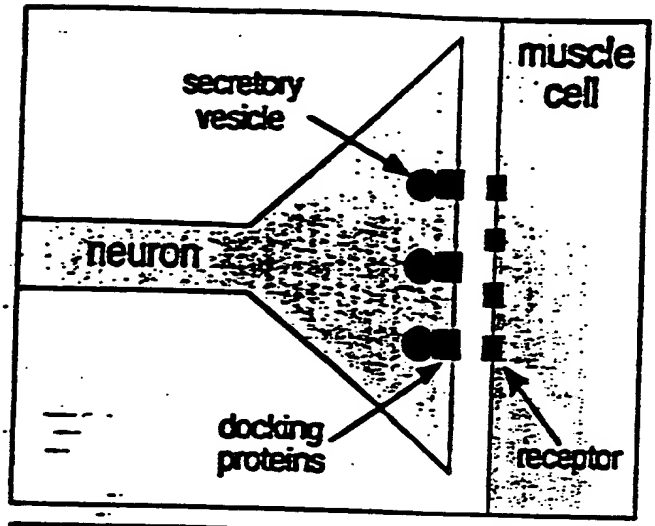


Fig. 45-A

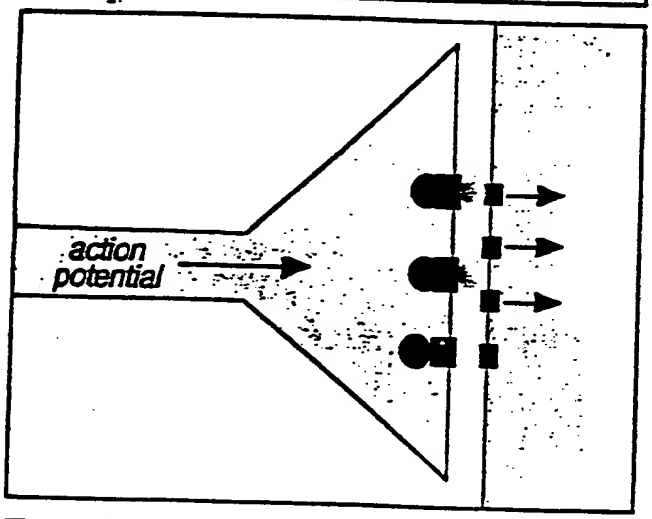


Fig. 45-B

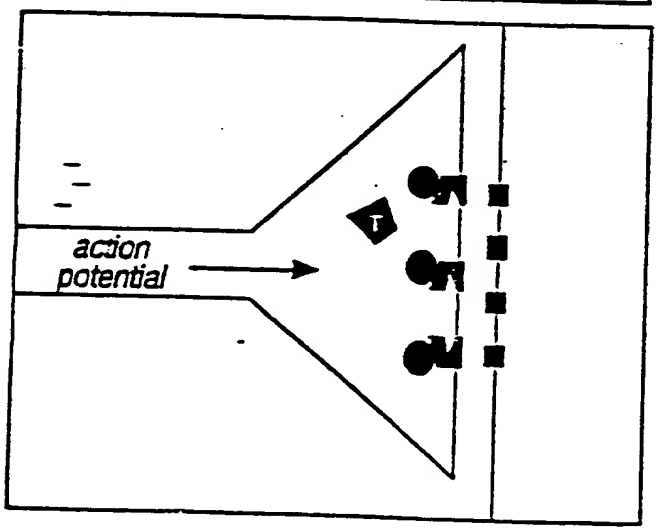


Fig. 45-C

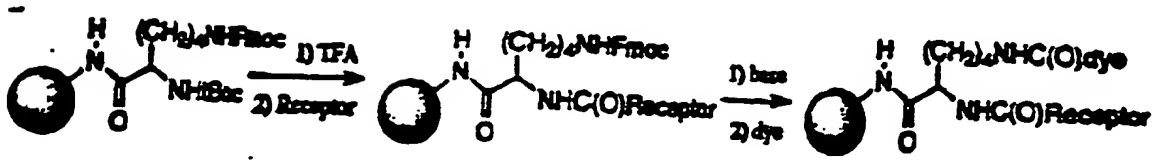


FIG. 45 D

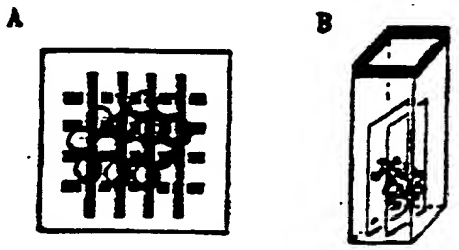
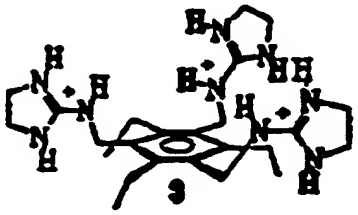
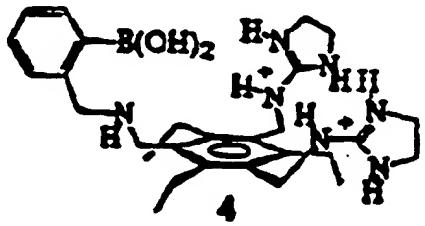


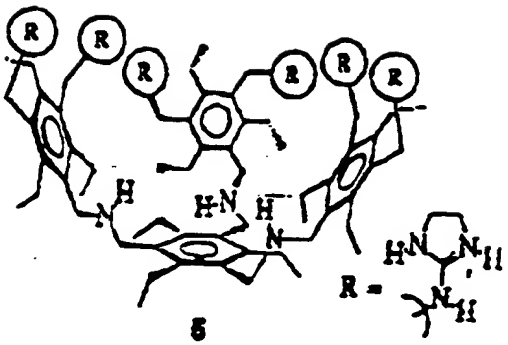
FIG. 46



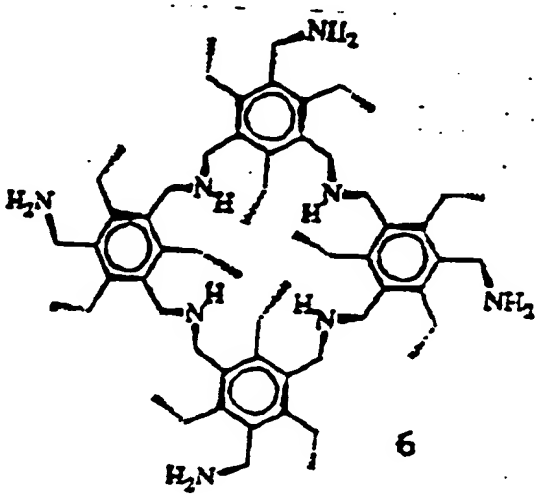
3



4

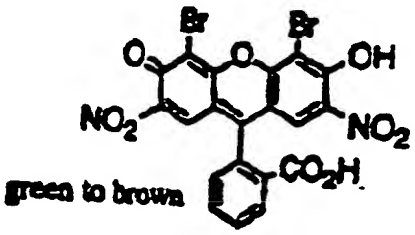


5

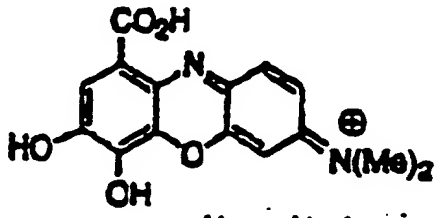


6

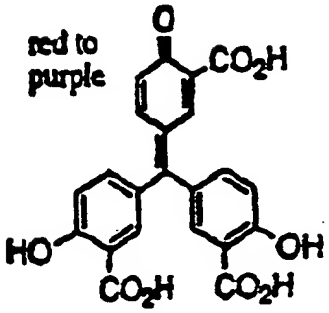
FIG. 47

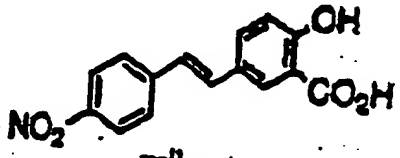


green to brown

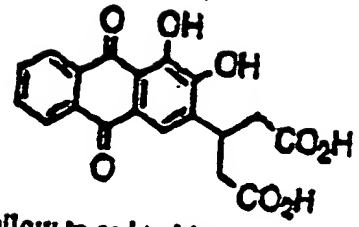


blue to black





yellow to orange



yellow to red to blue

Fig. 48

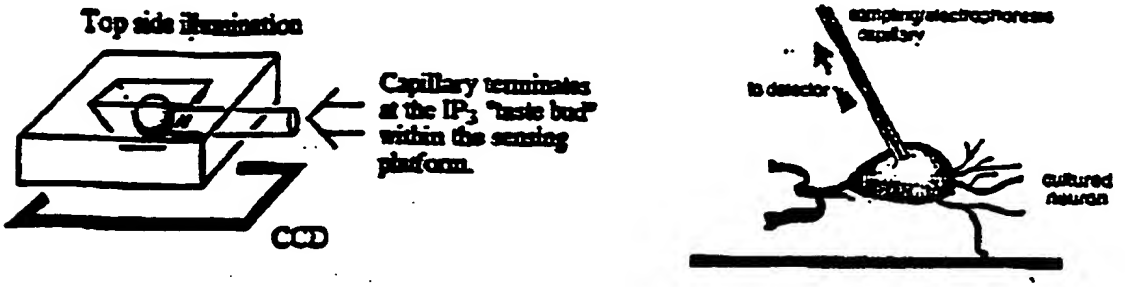

Top side illumination
Capillary terminates at the IP_3 "taste bud" within the sensing platform.
CCD
to detector
cultured neuron

FIG. 49

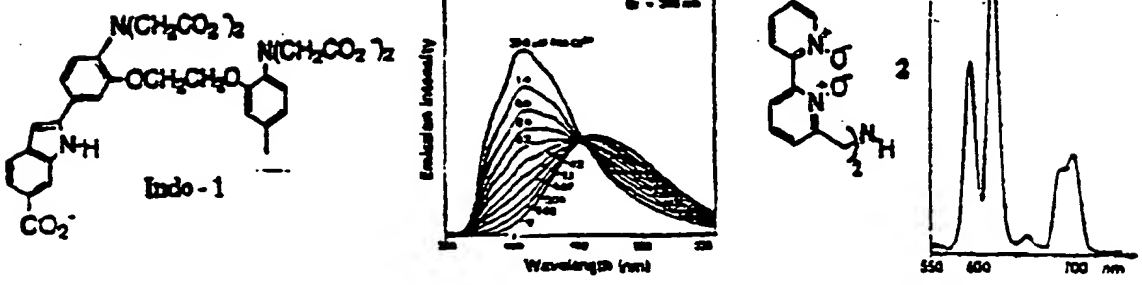

Indo-1
Wavelength (nm)
2
550
600
700 nm

FIG. 50

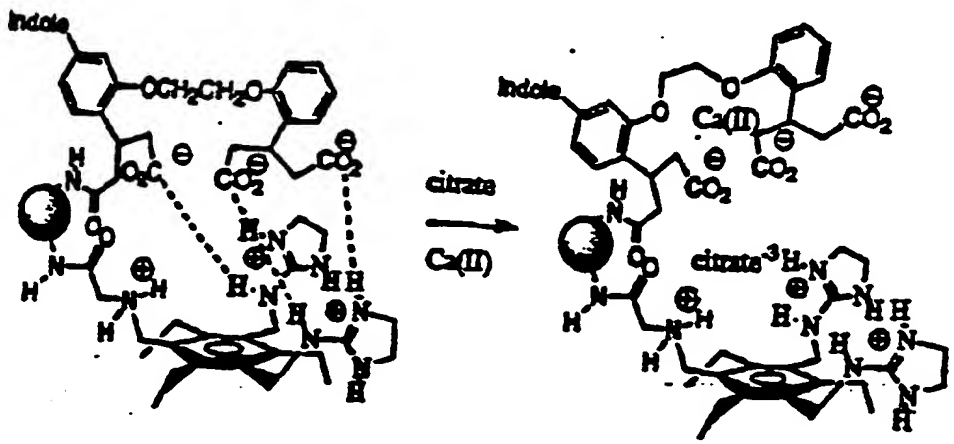

Indole
OCH_2CH_2O
citrate
Cu(II)
Indole
Cu(II)
citrate^{-3}H$^+$

FIG. 51

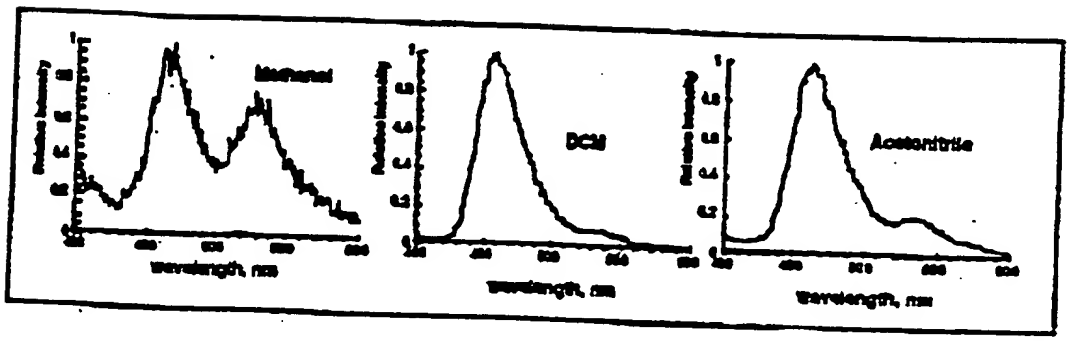

Methanol
DCM
Acetonitrile
Wavelength, nm
Wavelength, nm
Wavelength, nm

FIG. 52

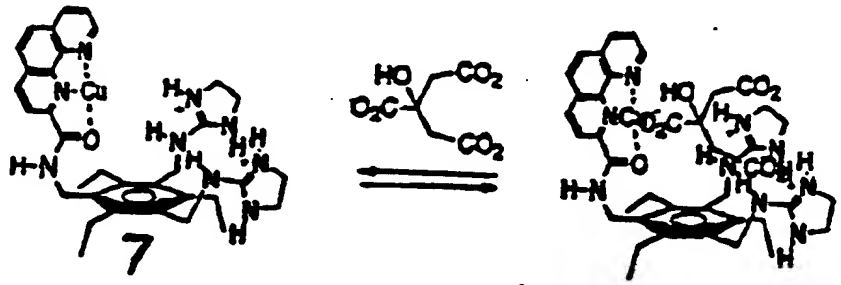


FIG. 53

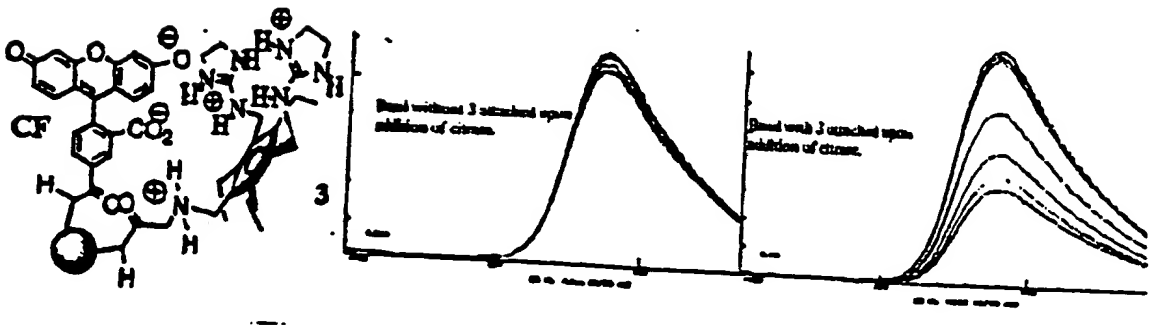


FIG. 54

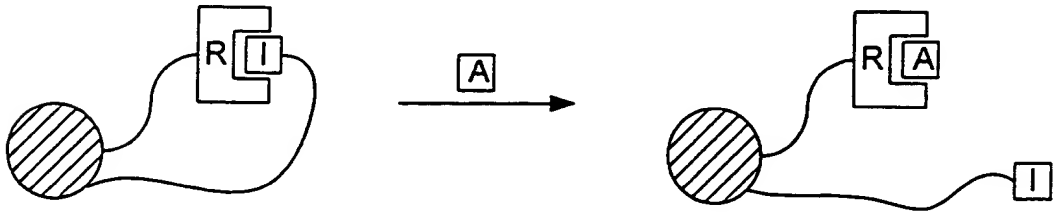


FIG. 55A

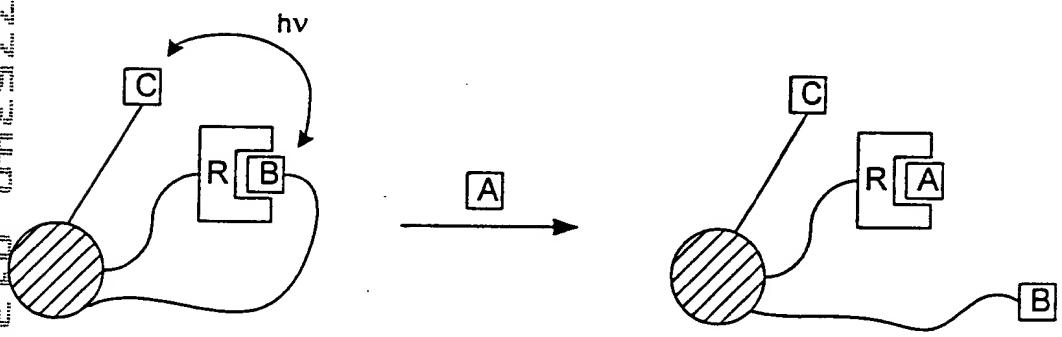


FIG. 55B

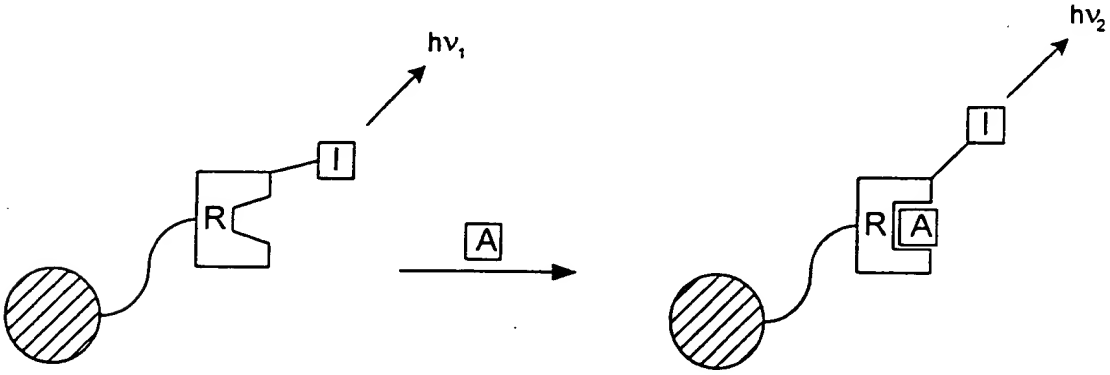


FIG. 55C

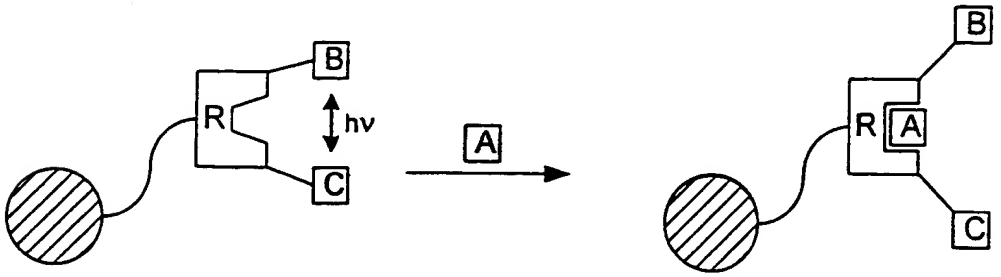


FIG. 55D

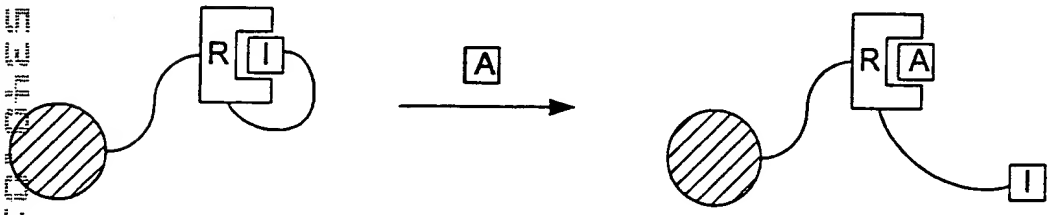


FIG. 55E

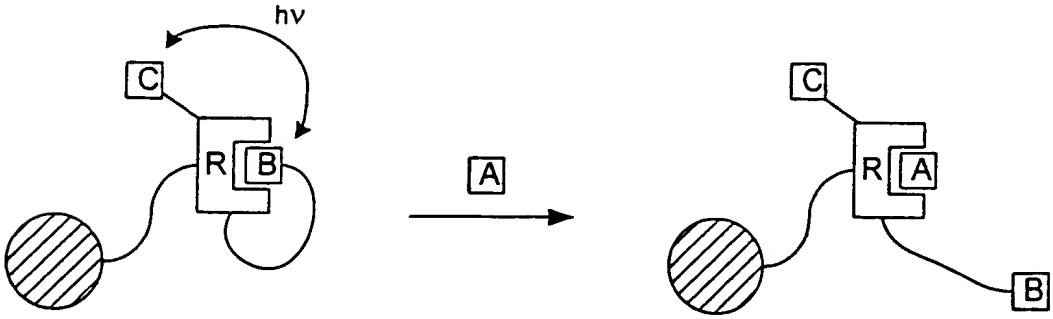


FIG. 55F

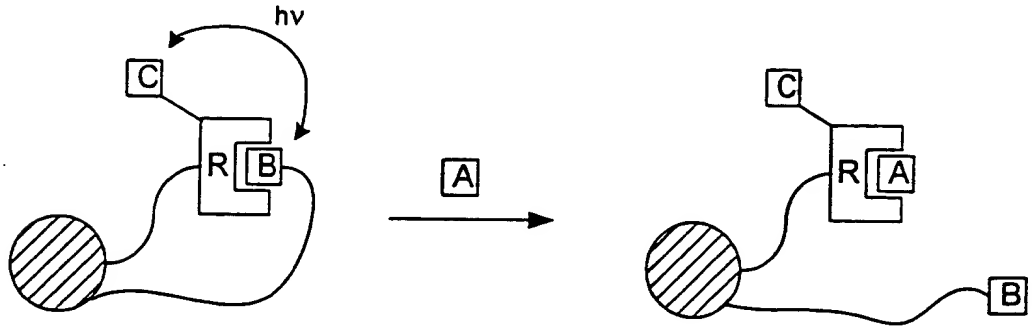


FIG. 55G

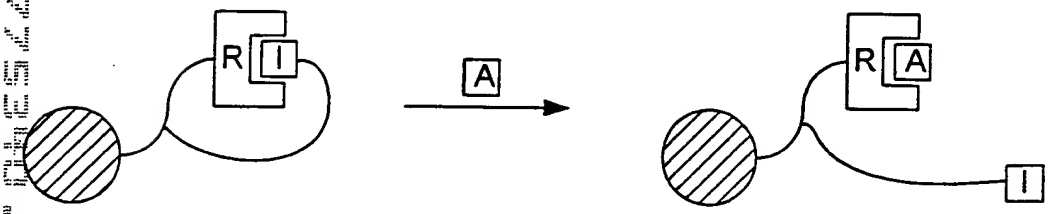


FIG. 55H

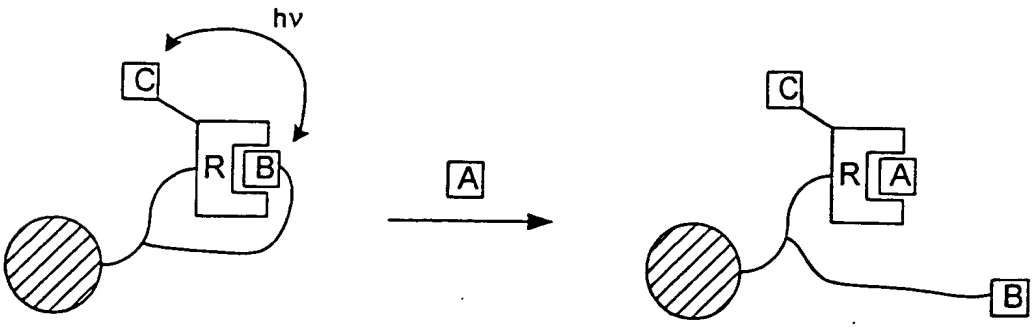
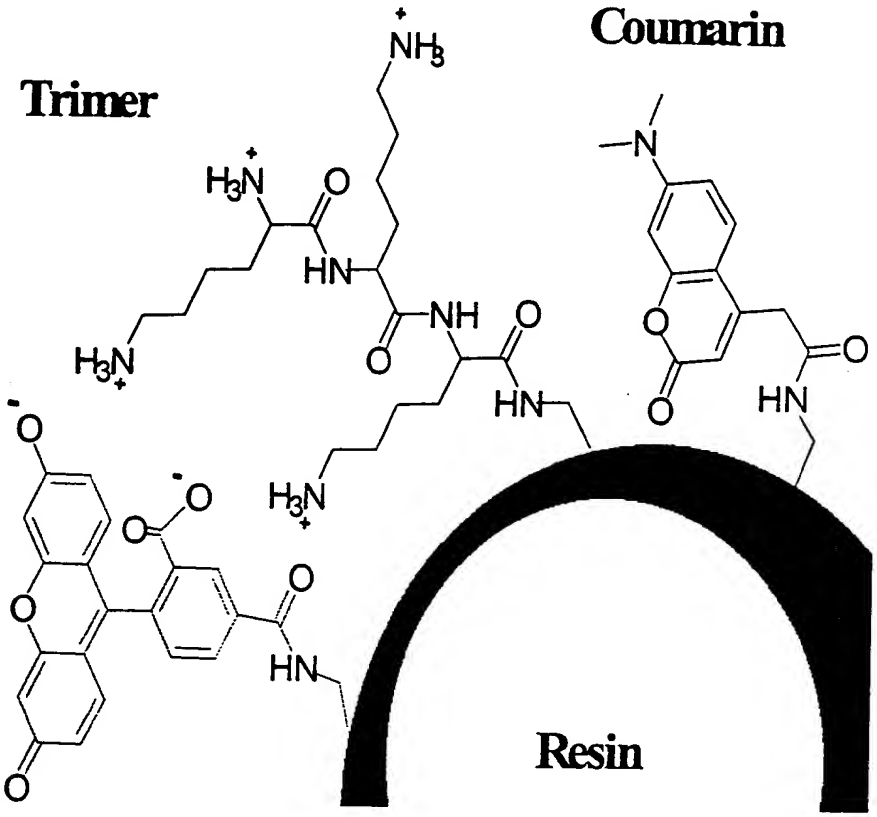


FIG. 55I



1

FIG. 56

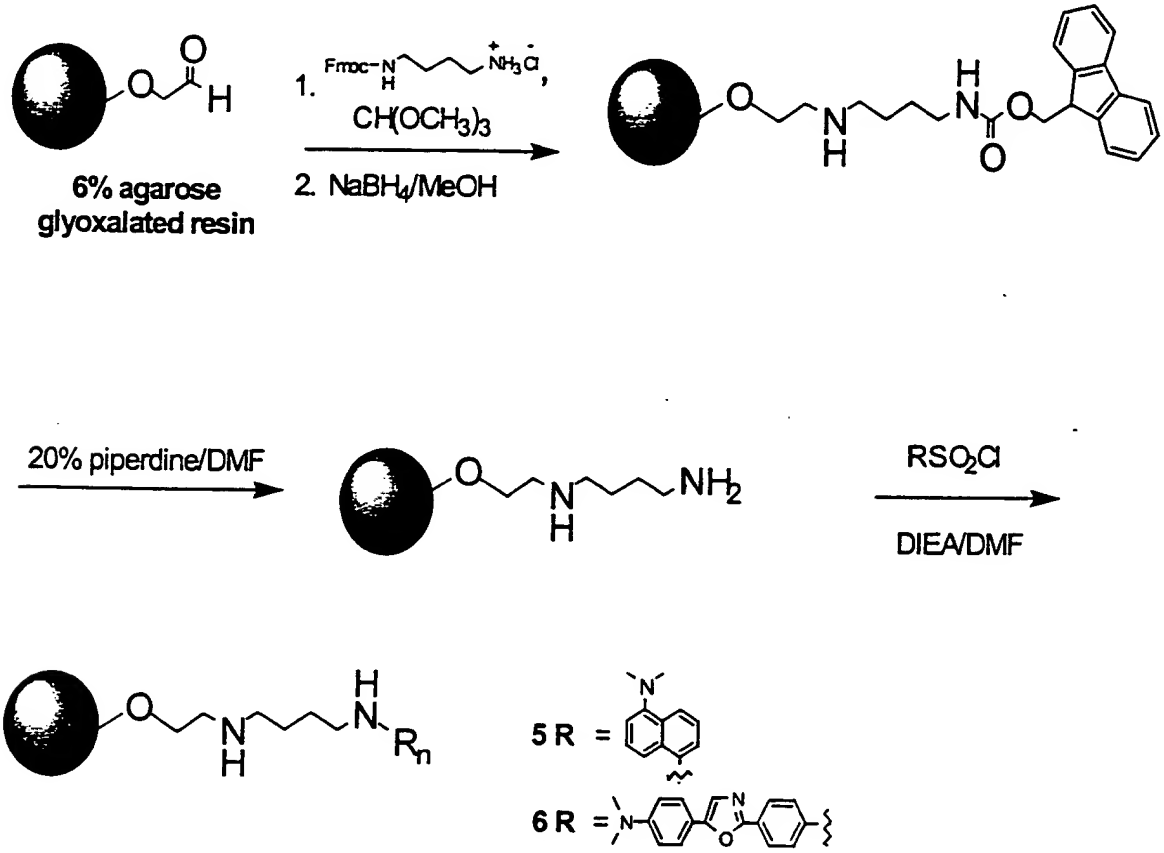

6% agarose
glyoxalated resin
1. Fmoc-N H NH3Cl,
CH(OCH3)3
2. NaBH4/MeOH
20% piperdine/DMF
RSO2Cl
DIEA/DMF
5 R =
6 R =

FIG. 57

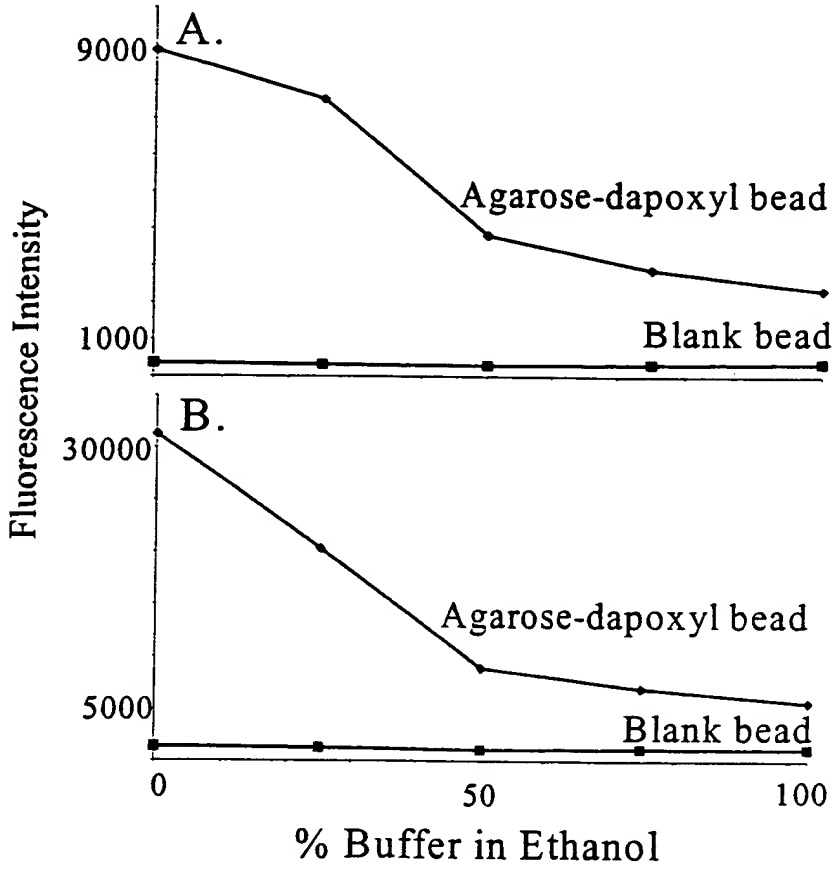

A.
9000
1000
Agarose-dapoxyl bead
Blank bead
B.
30000
5000
Agarose-dapoxyl bead
Blank bead
Fluorescence Intensity
0
50
100
% Buffer in Ethanol

FIG. 58

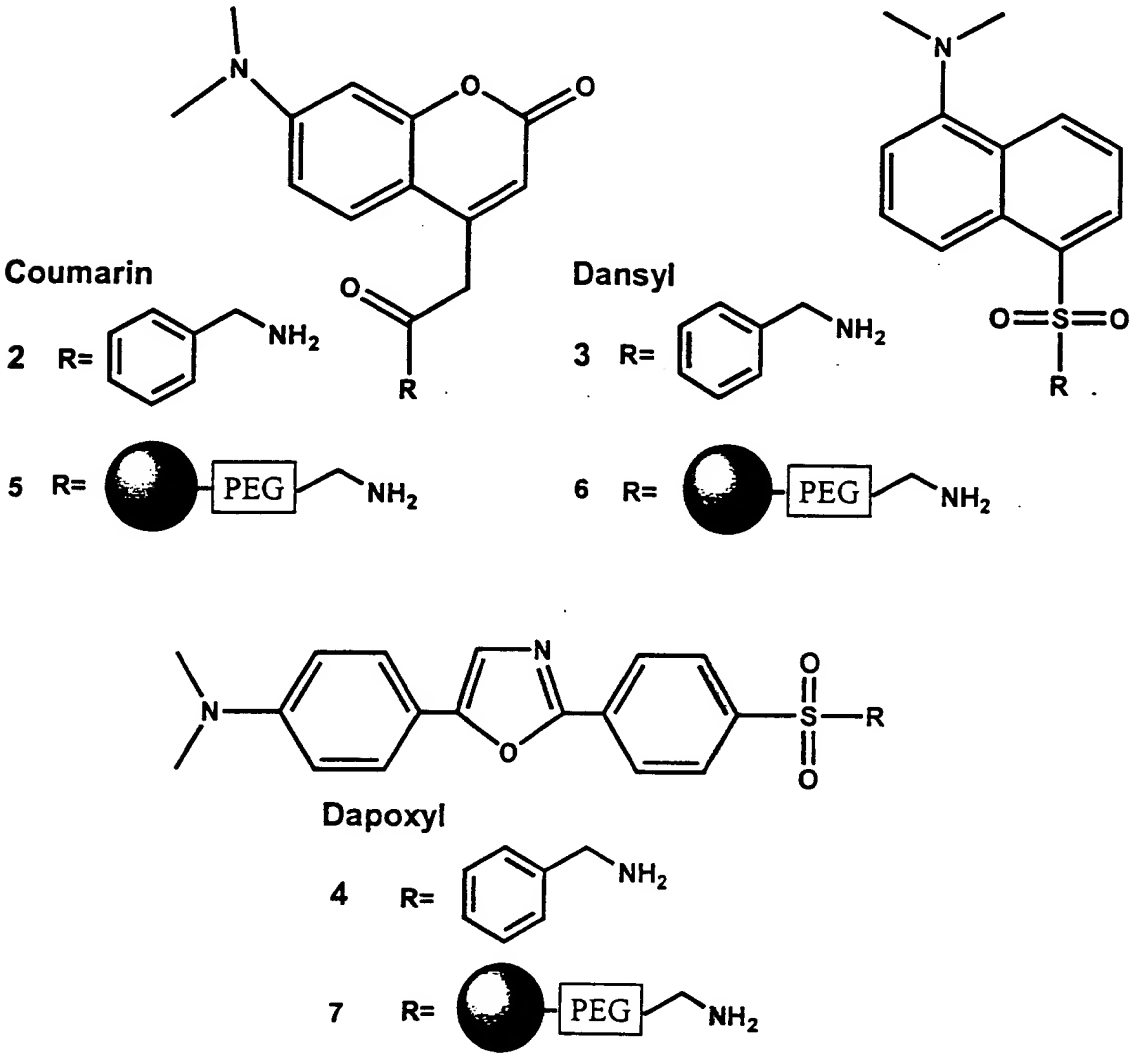

Coumarin
2 R=
NH2
R
5 R=
PEG
NH2
Dansyl
3 R=
NH2
R
6 R=
PEG
NH2
Dapoxyl
4 R=
NH2
7 R=
PEG
NH2

FIG. 59

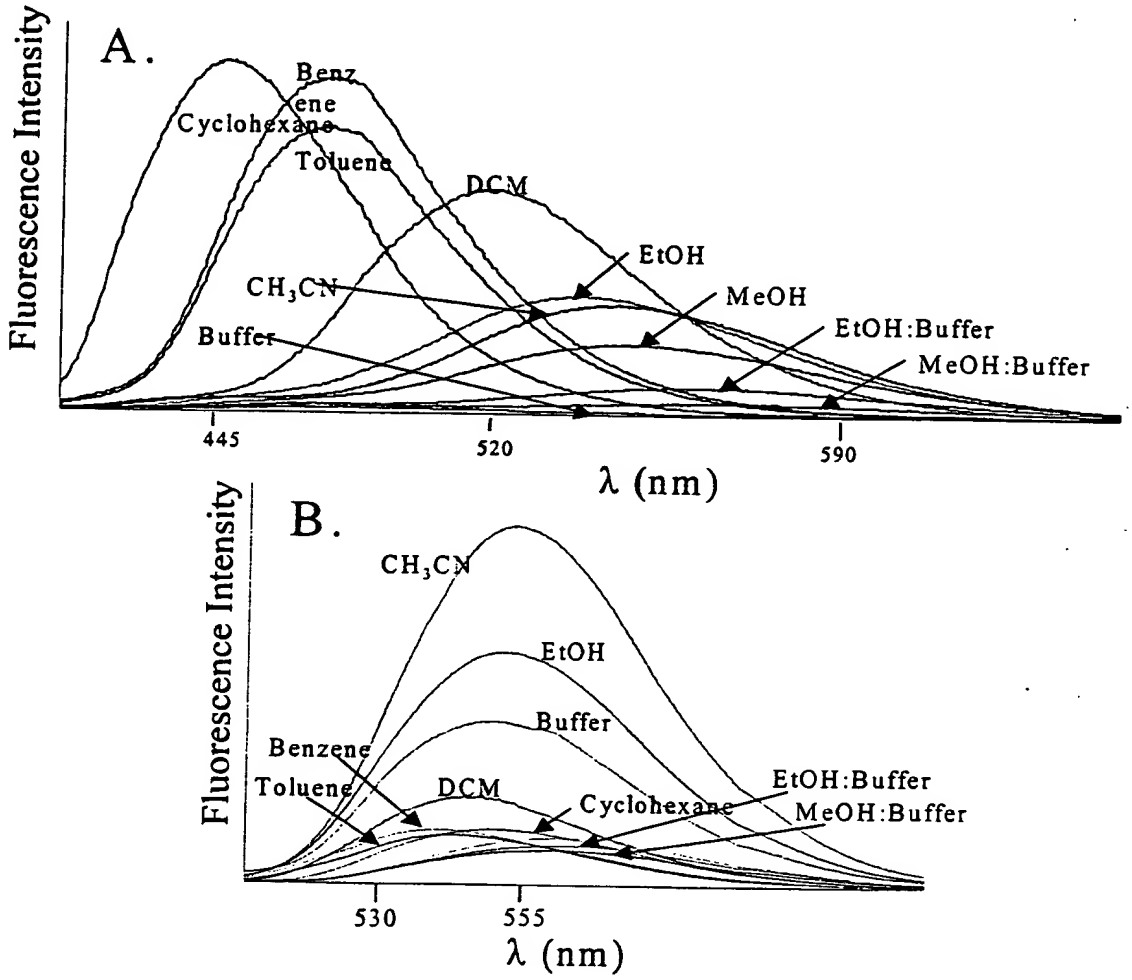
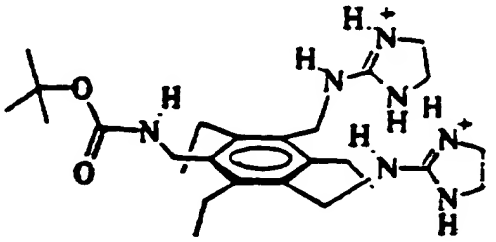
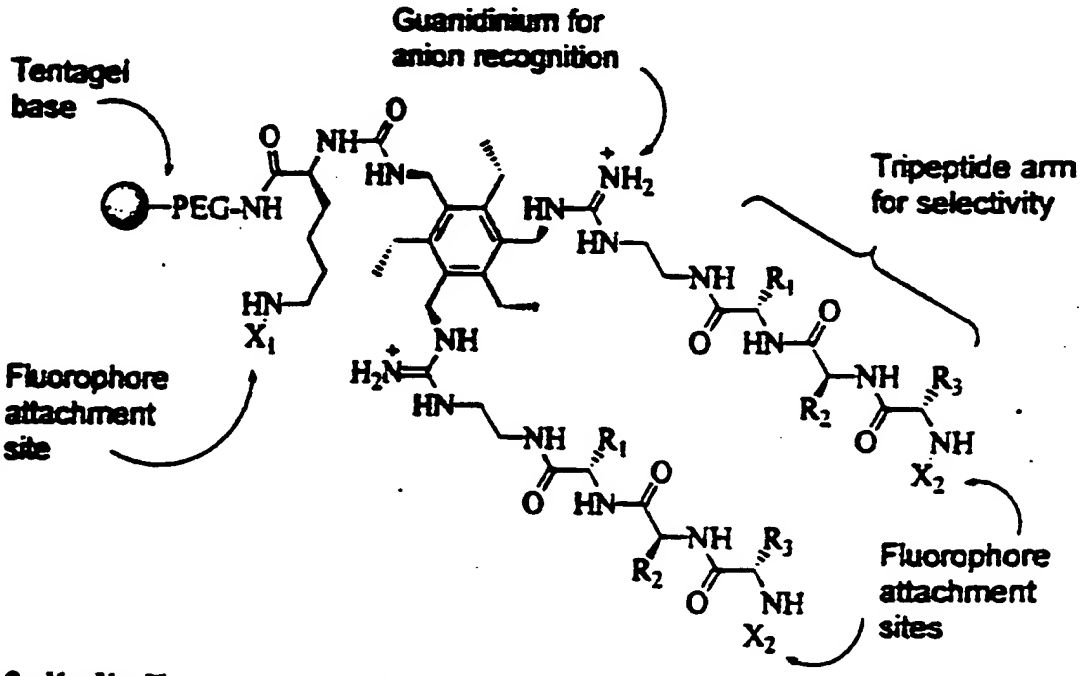

A.
Fluorescence Intensity
Benz
ene
Cyclohexane
Toluene
DCM
EtOH
MeOH
CH_3CN
Buffer
EtOH:Buffer
MeOH:Buffer
445
520
590
λ (nm)
B.
Fluorescence Intensity
CH_3CN
EtOH
Buffer
Benzene
Toluene
DCM
Cyclohexane
EtOH:Buffer
MeOH:Buffer
530
555
λ (nm)

FIG. 60



1



2: X_1=X_2=H

3: X_1= X_2=

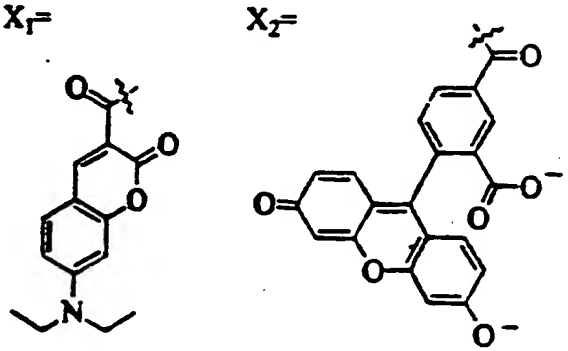


FIG. 61

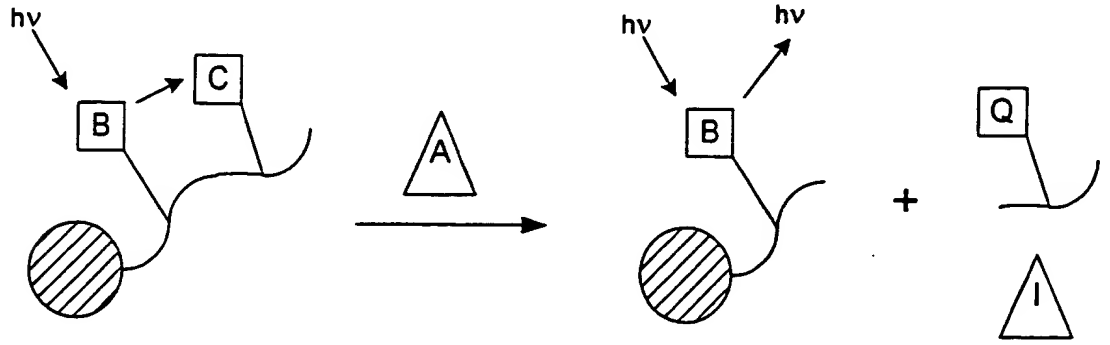


FIG. 62A

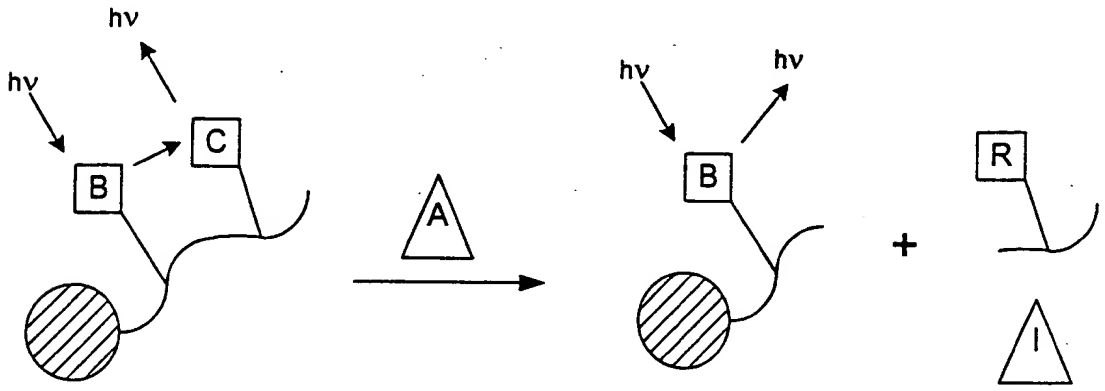


FIG. 62B

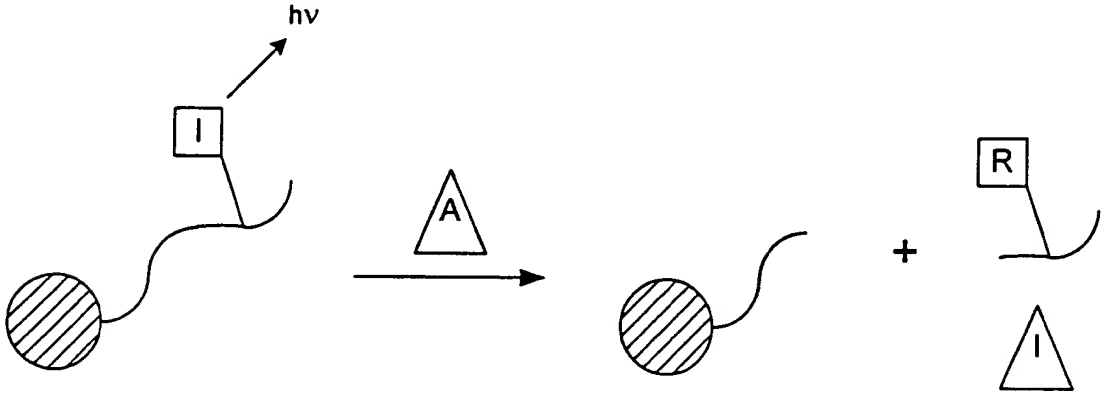


FIG. 62C

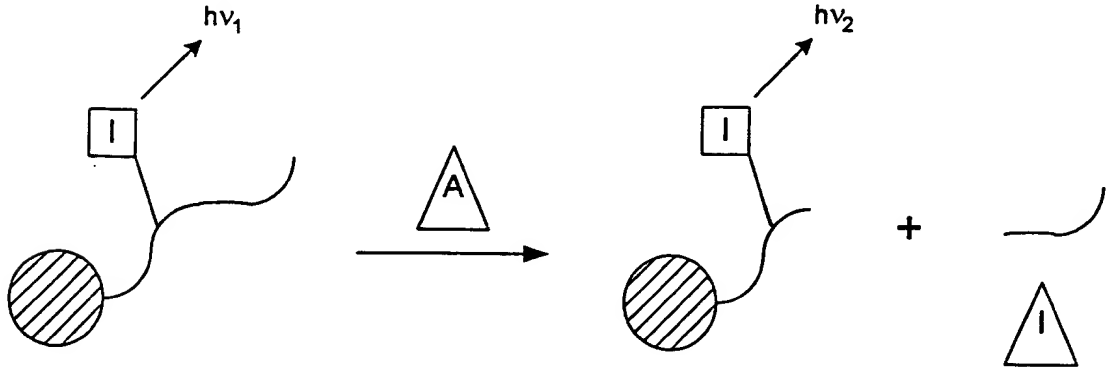


FIG. 62D

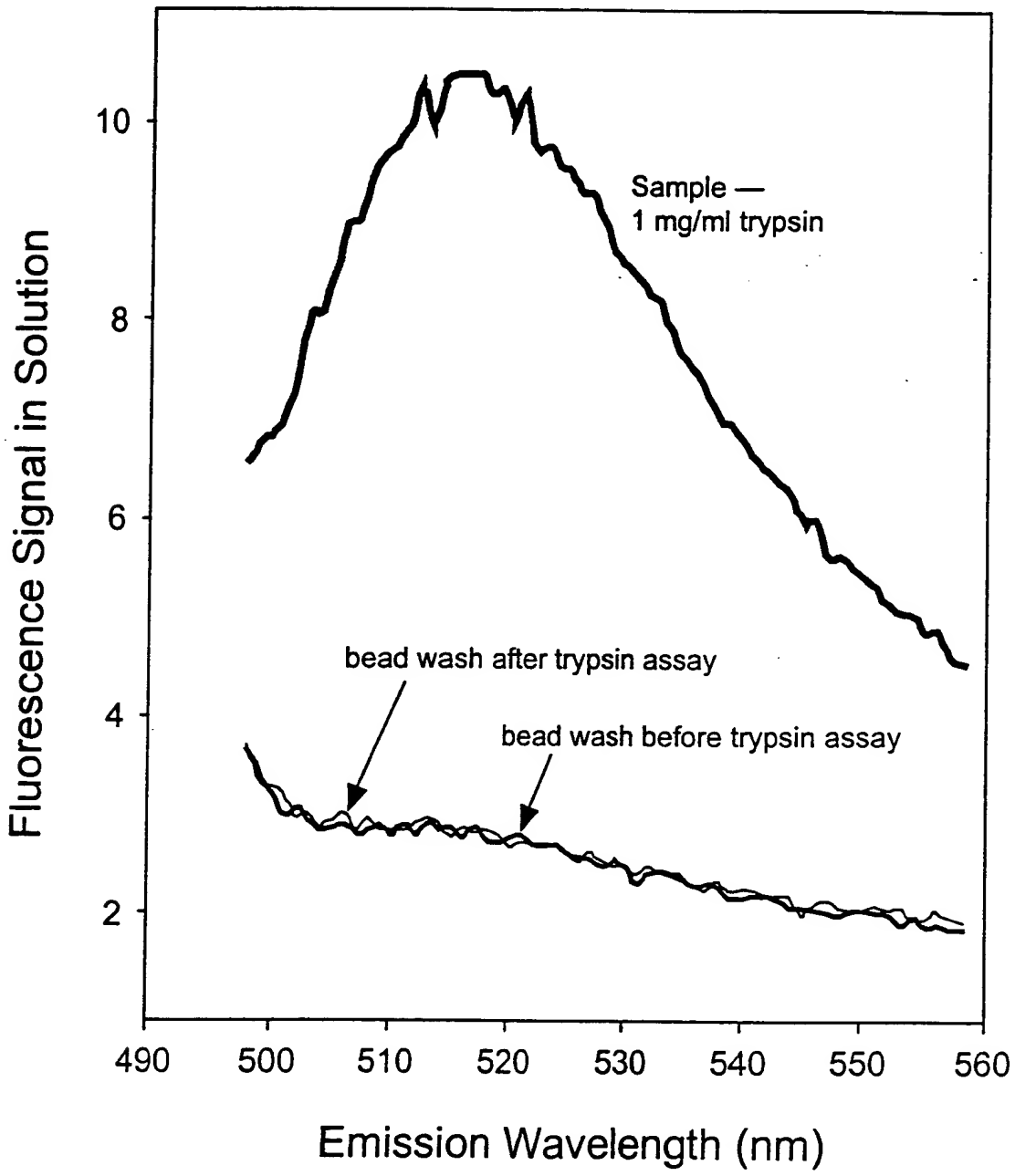

Fluorescence Signal in Solution
10
8
6
4
2
Sample —
1 mg/ml trypsin
bead wash after trypsin assay
bead wash before trypsin assay
490
500
510
520
530
540
550
560
Emission Wavelength (nm)

FIG. 63

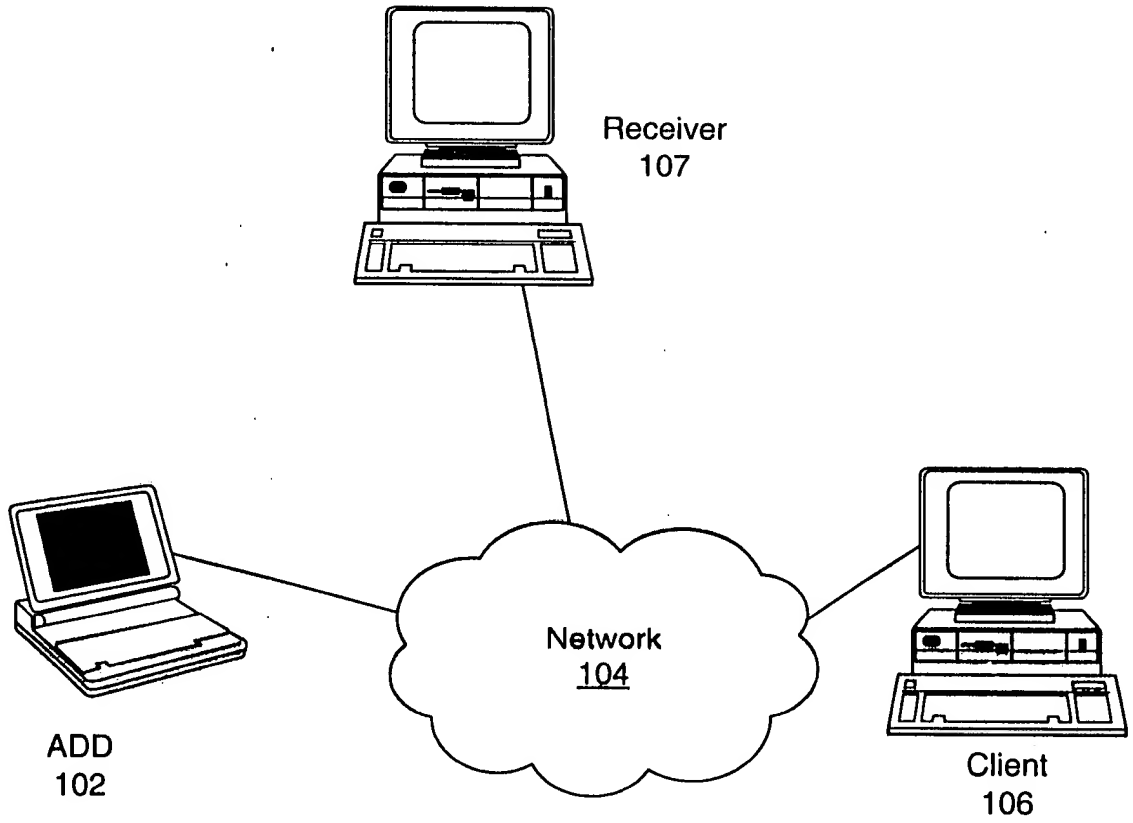


FIG. 64

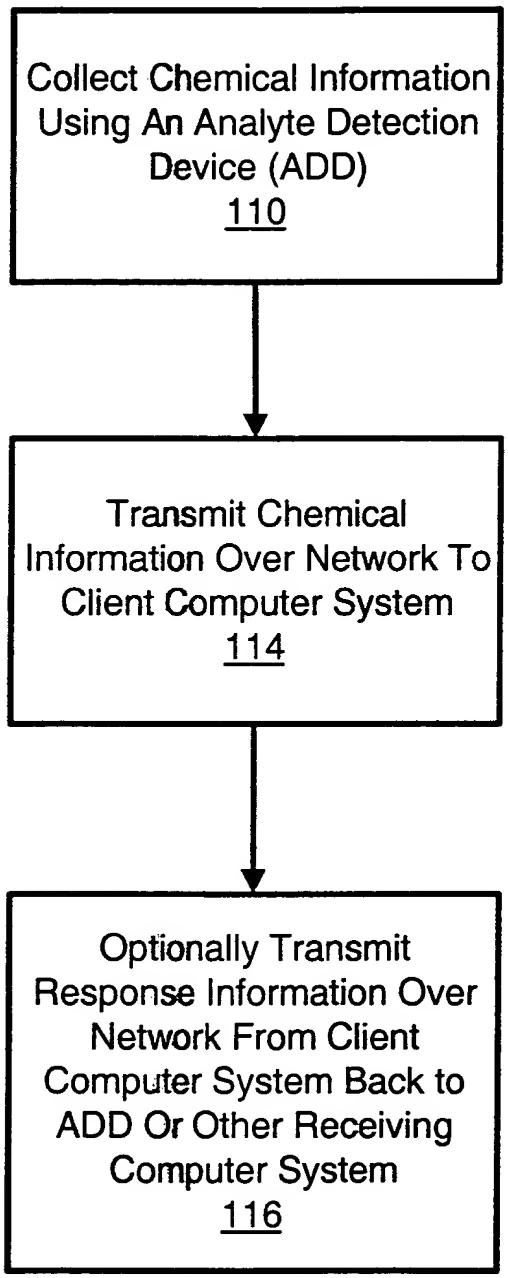

Collect Chemical Information Using An Analyte Detection Device (ADD)
110
Transmit Chemical Information Over Network To Client Computer System
114
Optionally Transmit Response Information Over Network From Client Computer System Back to ADD Or Other Receiving Computer System
116

FIG. 65

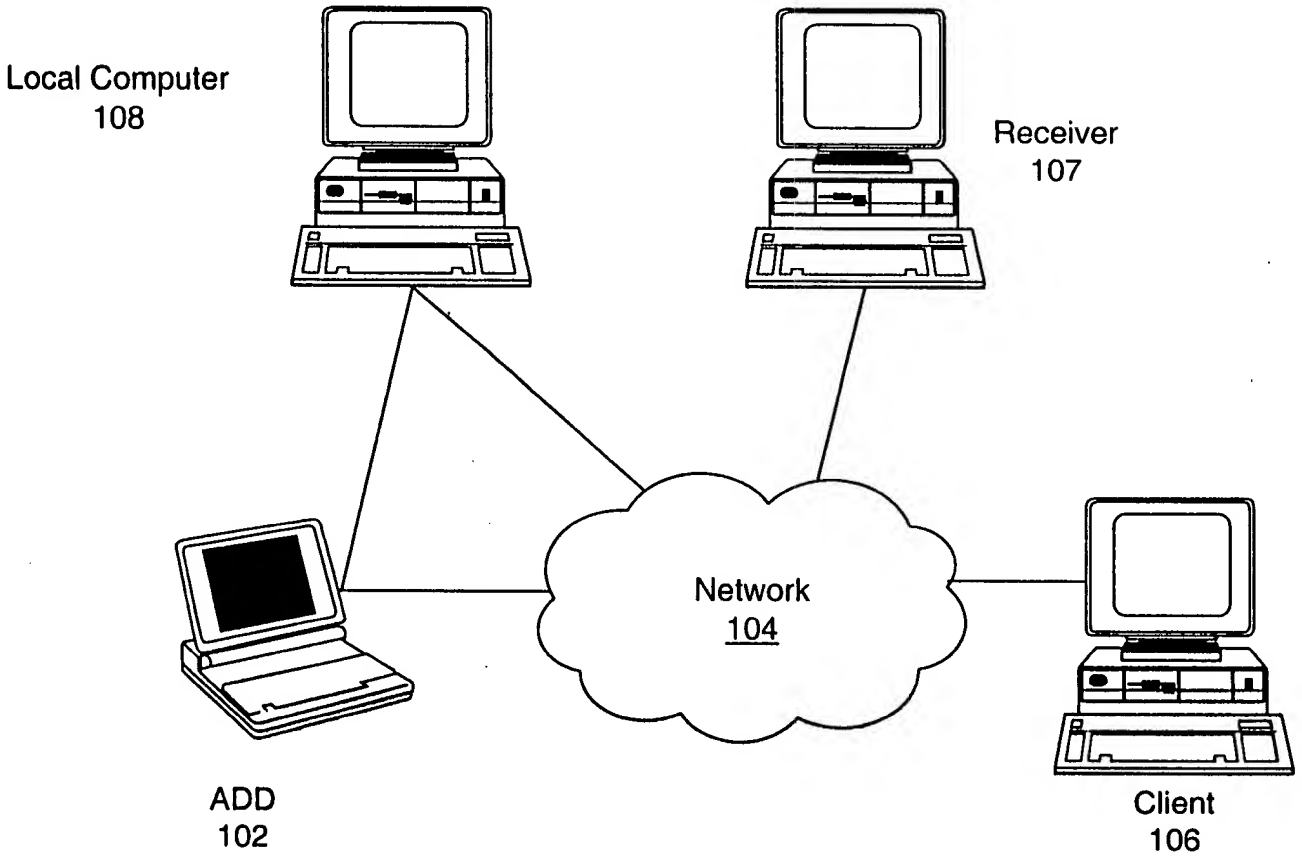


FIG. 66

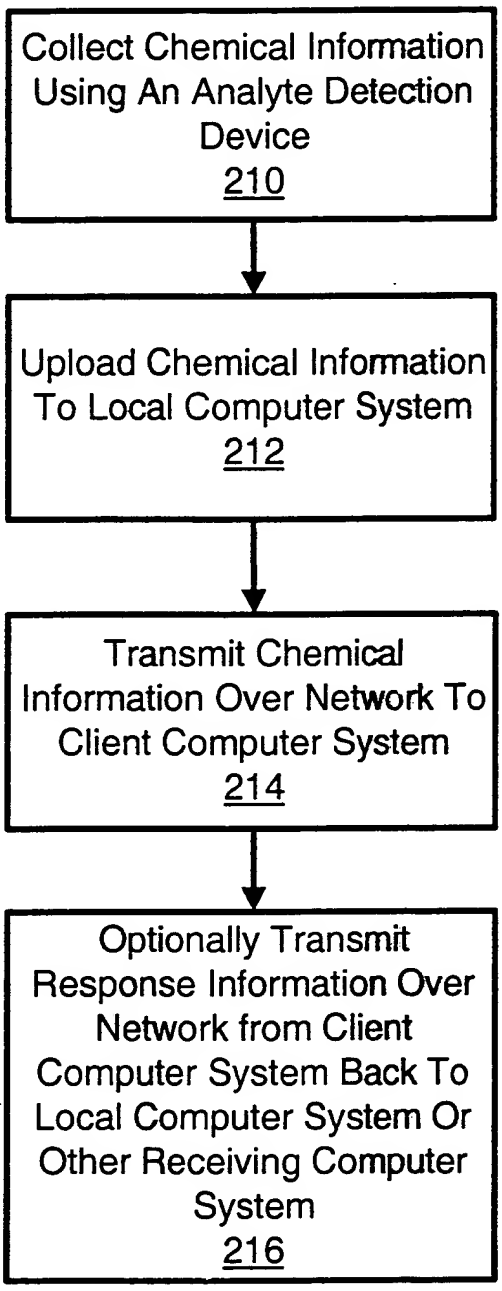

Collect Chemical Information Using An Analyte Detection Device
210
Upload Chemical Information To Local Computer System
212
Transmit Chemical Information Over Network To Client Computer System
214
Optionally Transmit Response Information Over Network from Client Computer System Back To Local Computer System Or Other Receiving Computer System
216

FIG. 67

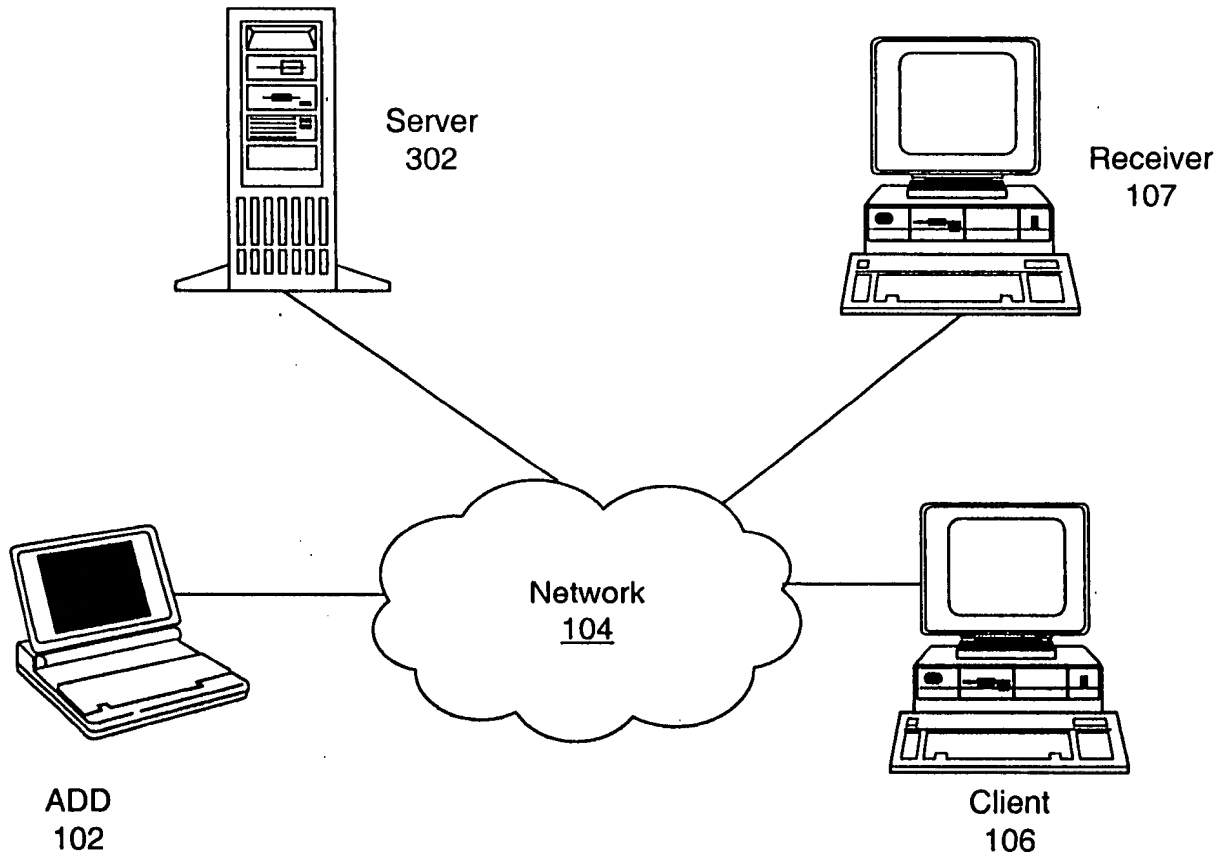


FIG. 68

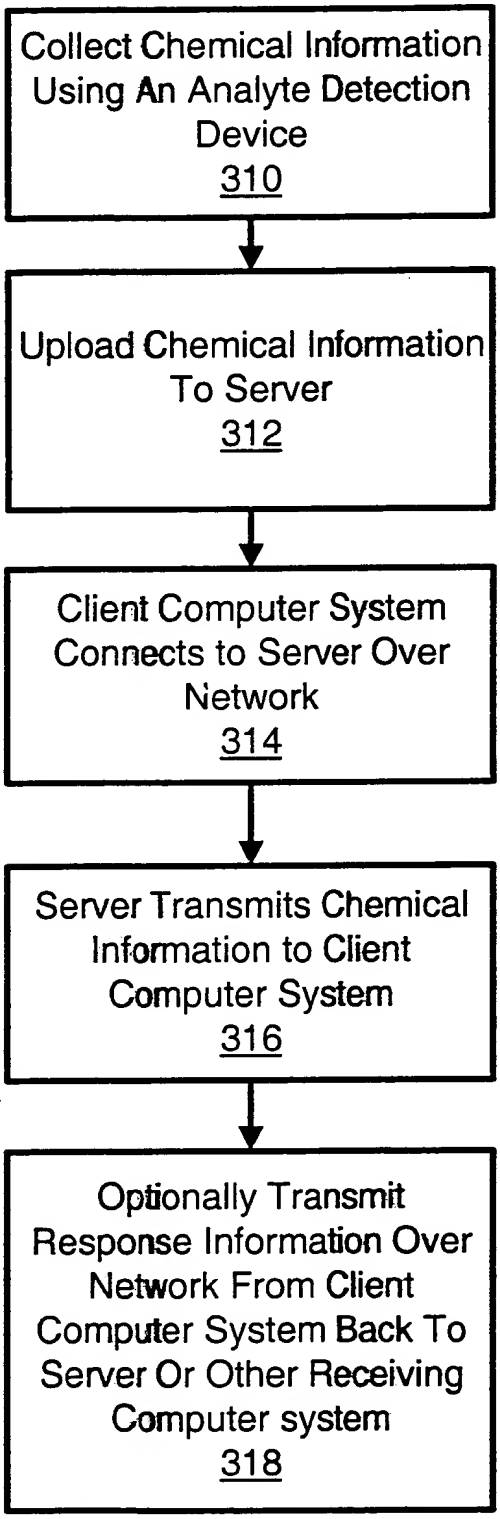

Collect Chemical Information Using An Analyte Detection Device
310
Upload Chemical Information To Server
312
Client Computer System Connects to Server Over Network
314
Server Transmits Chemical Information to Client Computer System
316
Optionally Transmit Response Information Over Network From Client Computer System Back To Server Or Other Receiving Computer system
318

FIG. 69

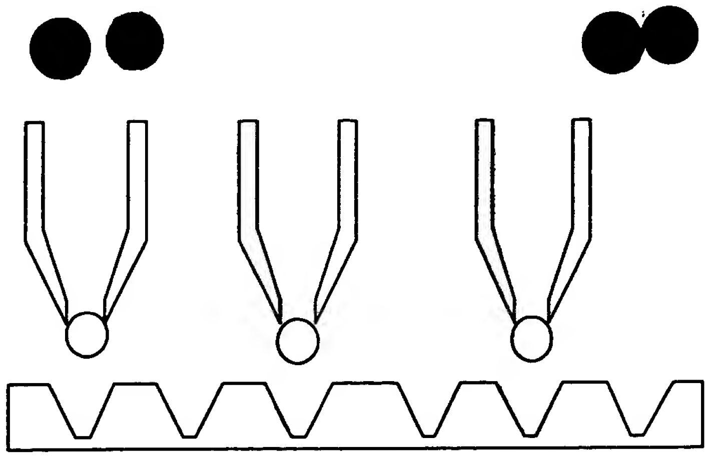


FIG. ~~52A~~ 70A

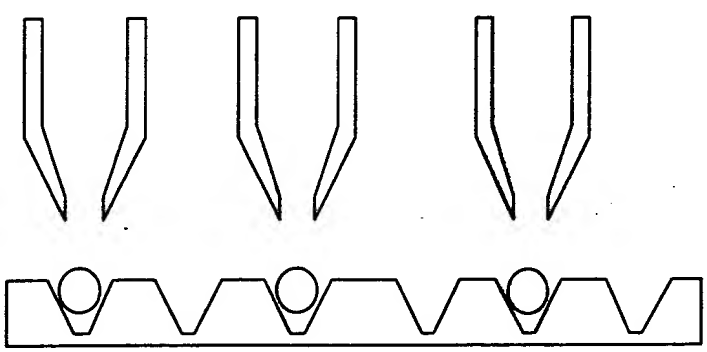


FIG. ~~52B~~ 70B

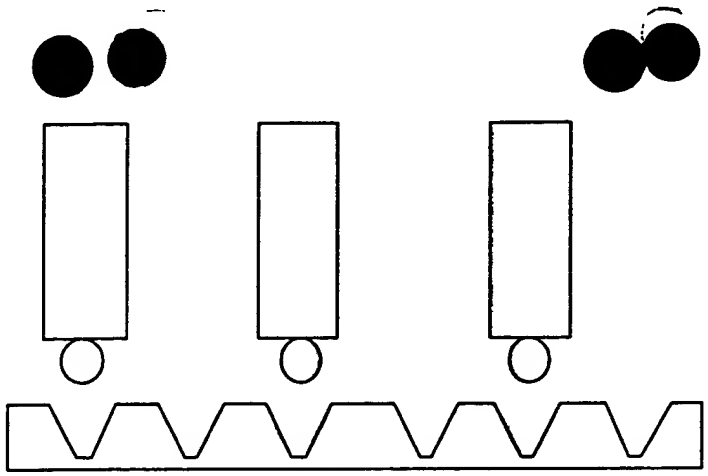


FIG. 5~~8~~ 7A

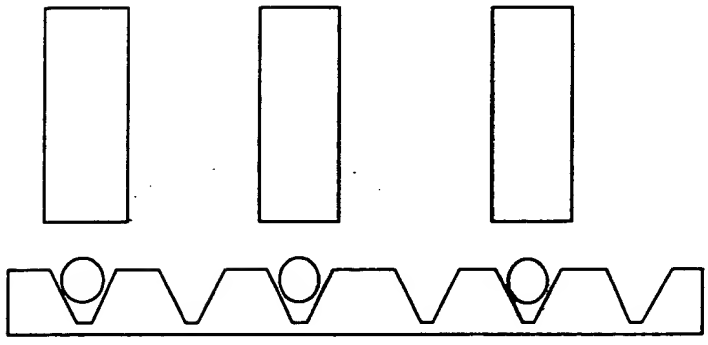


FIG. 5~~8~~ 7B

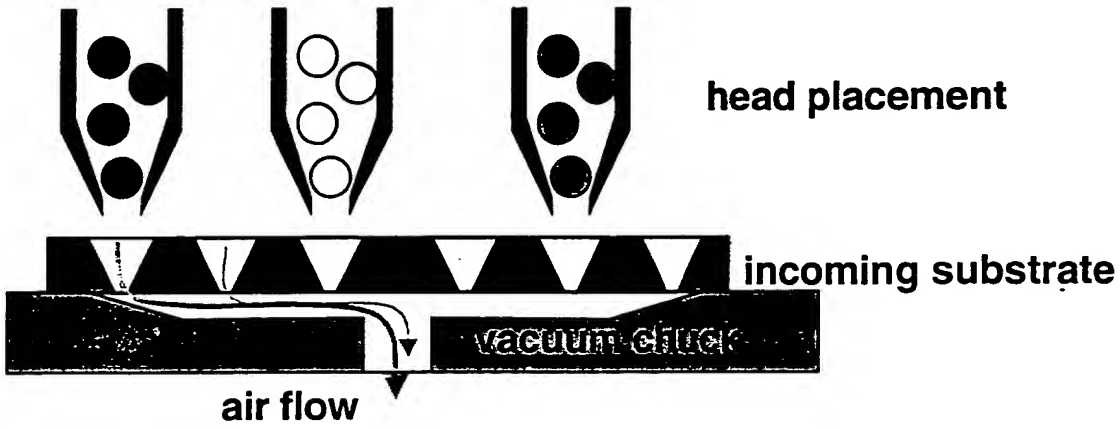


FIG. 72A

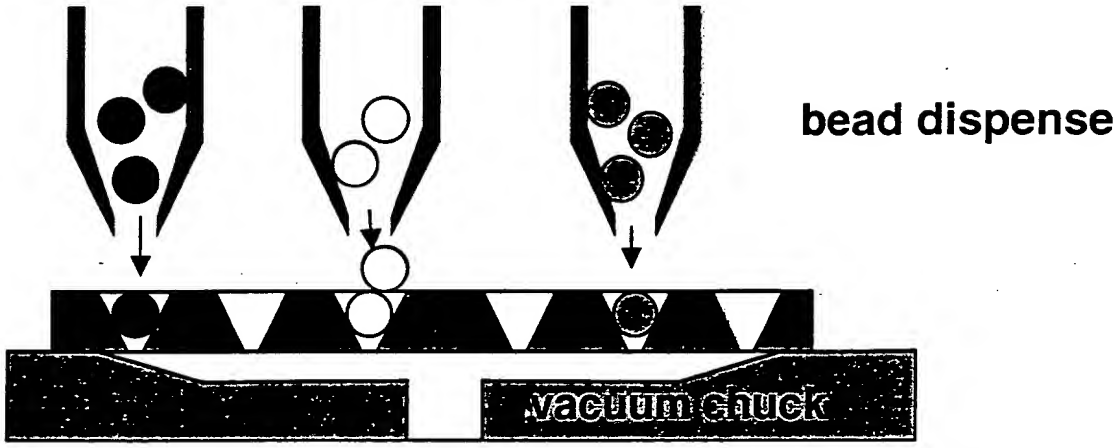


FIG. 72B

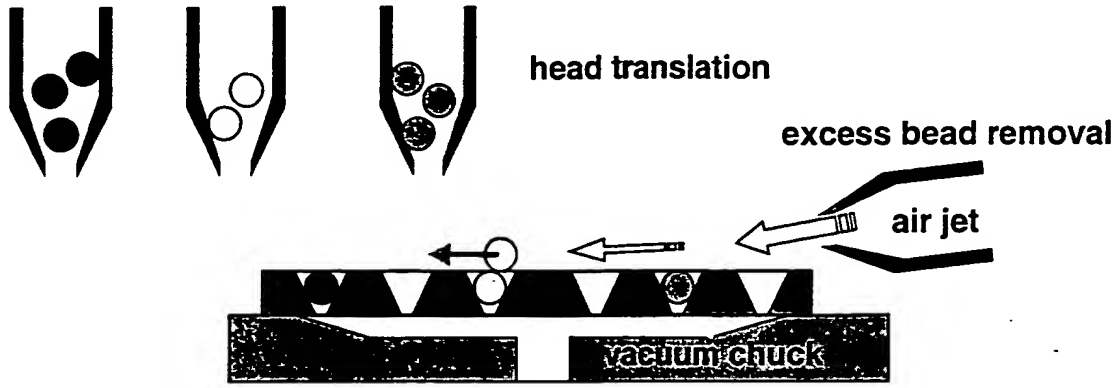


FIG. 72C

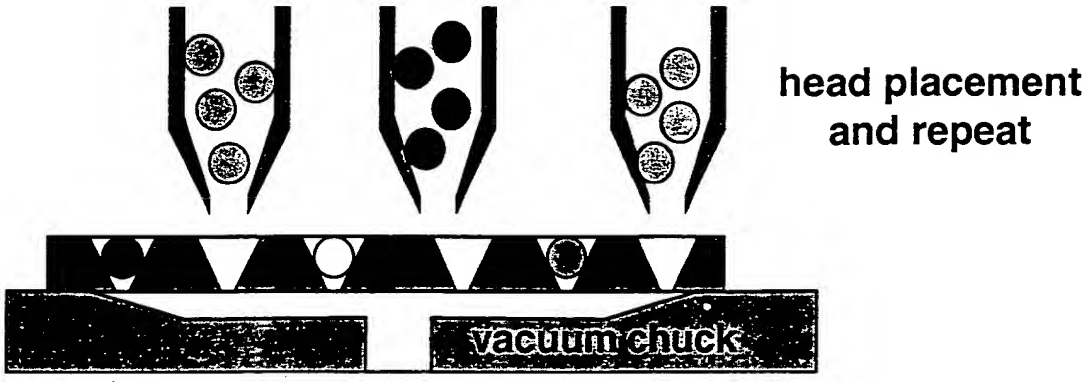


FIG. 72D

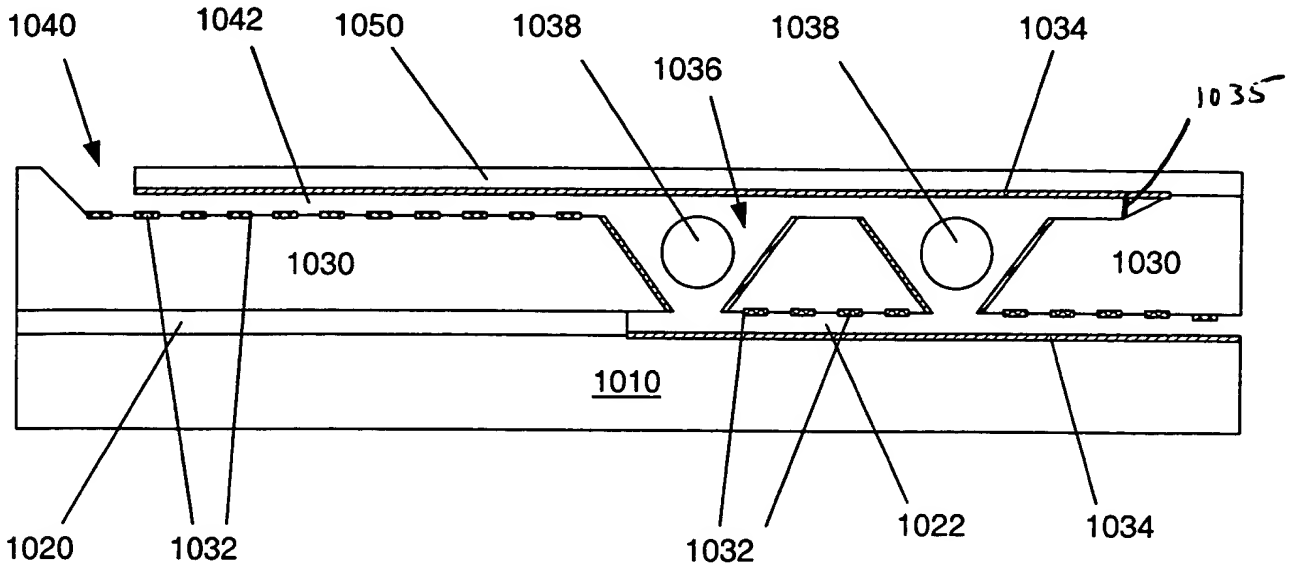


FIG. 73

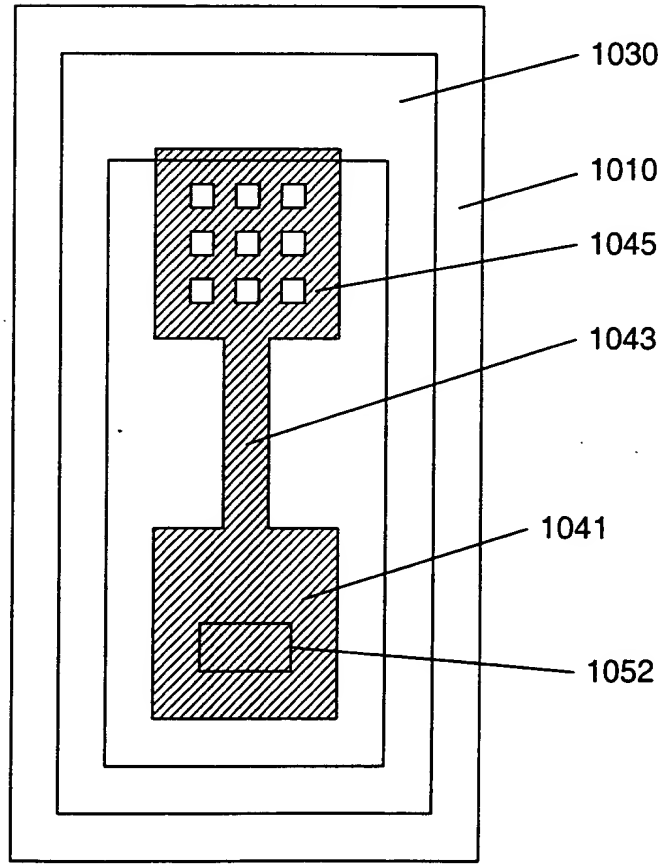


FIG. 5A
74

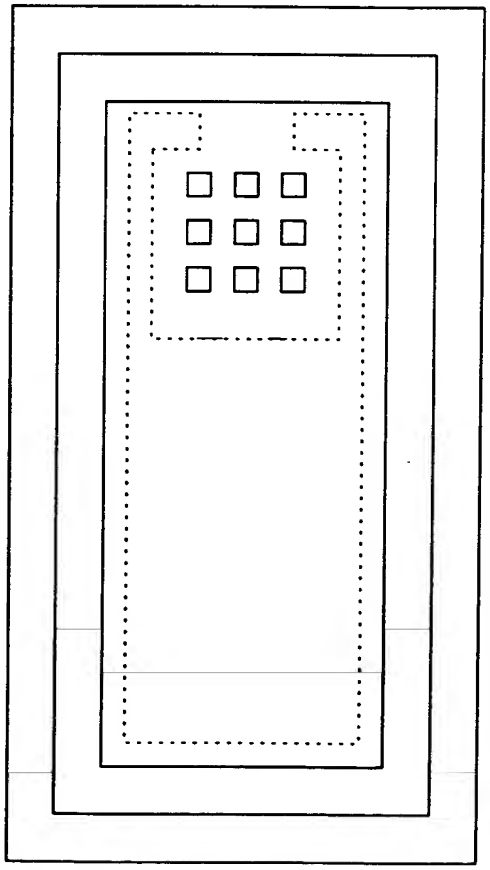


FIG. 5B
74

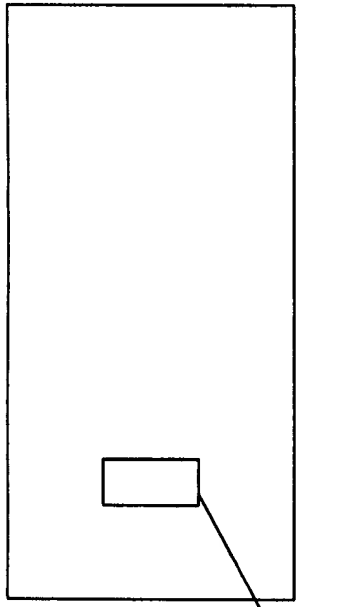
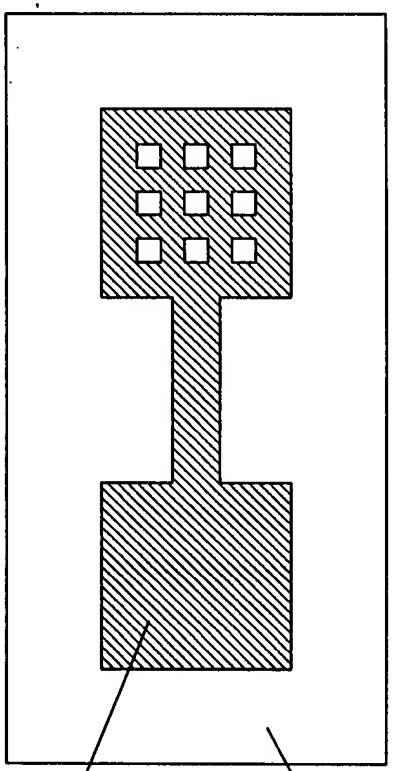


FIG. 5A
75

1052



1031

1033

FIG. 5B
75

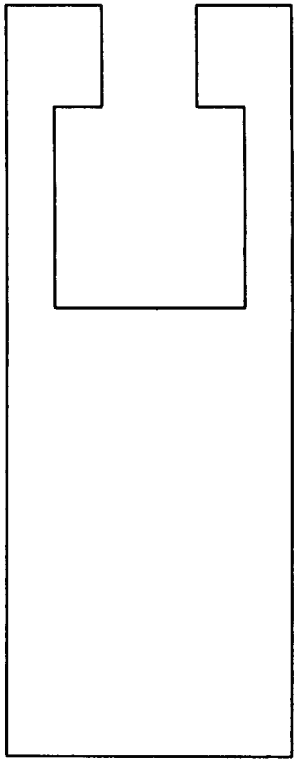


FIG. 5C
75

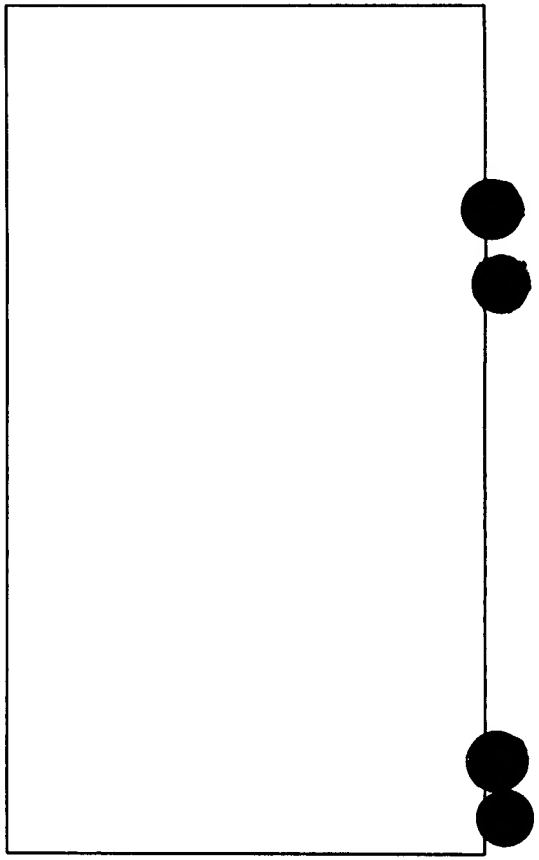


FIG. 5D
75

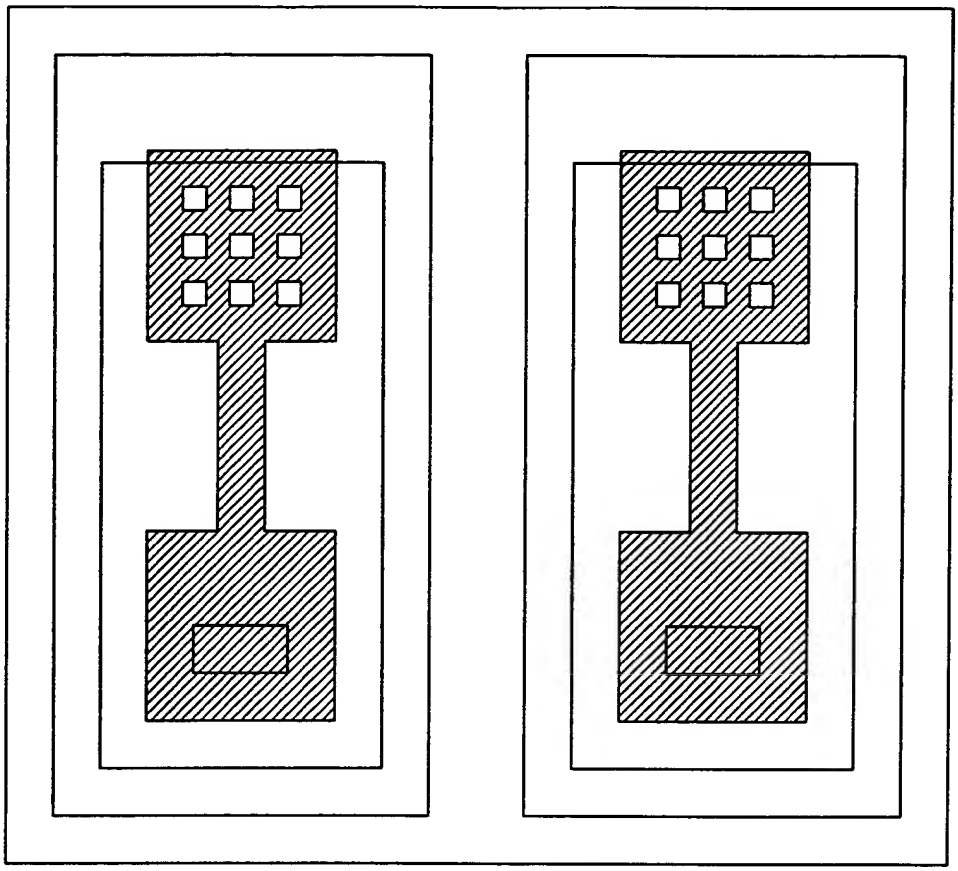


FIG. 76

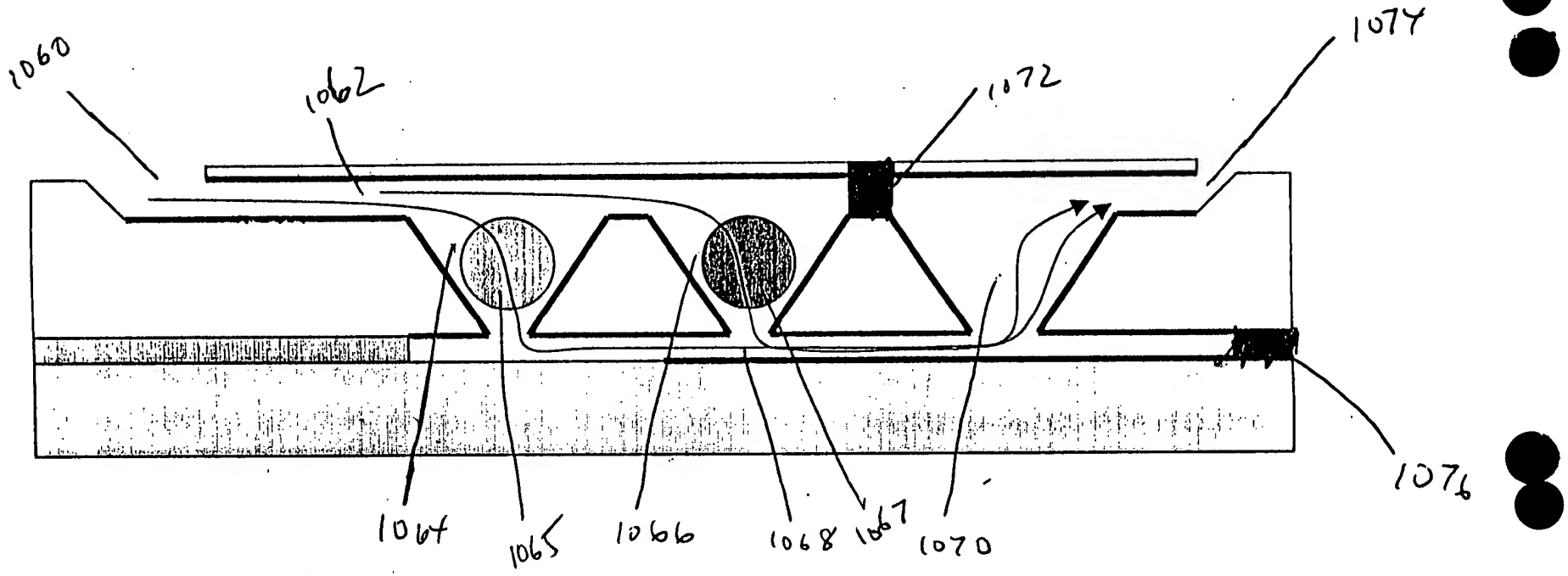


FIG. 77

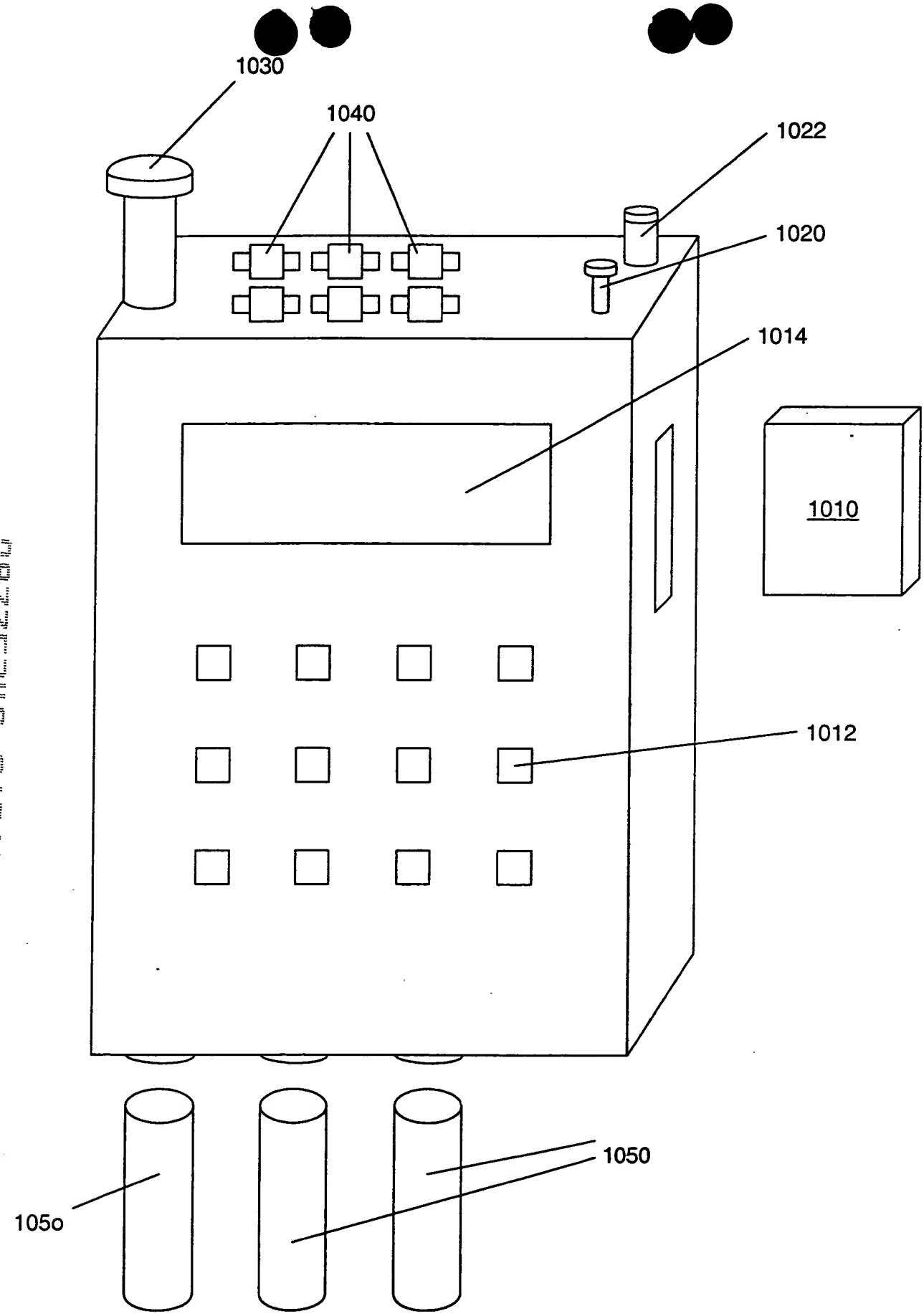


FIG. 7B

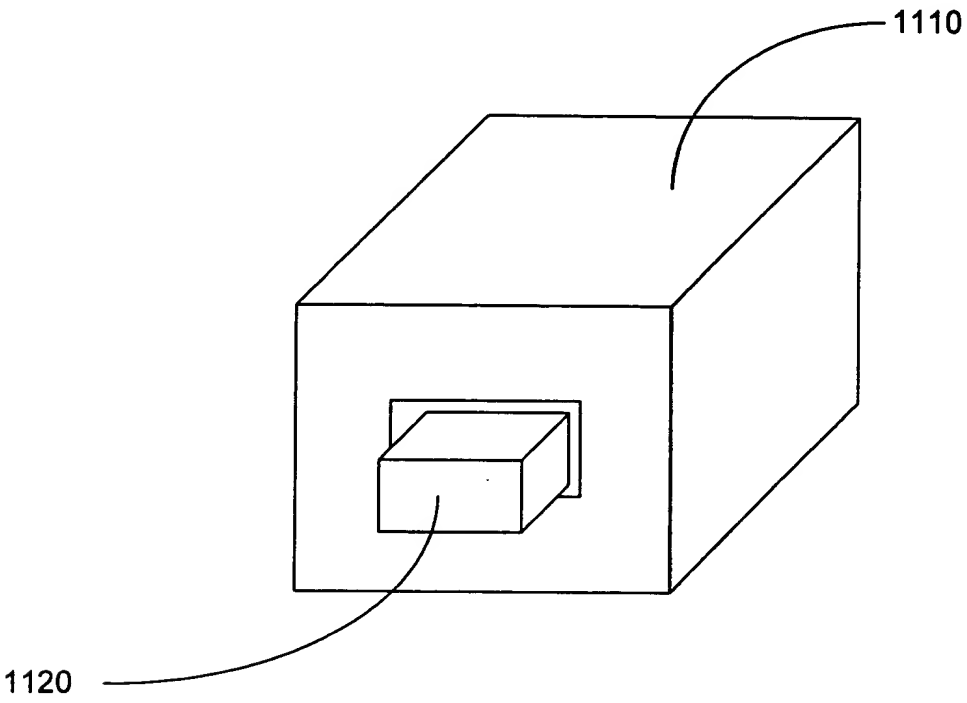


FIG. 79A

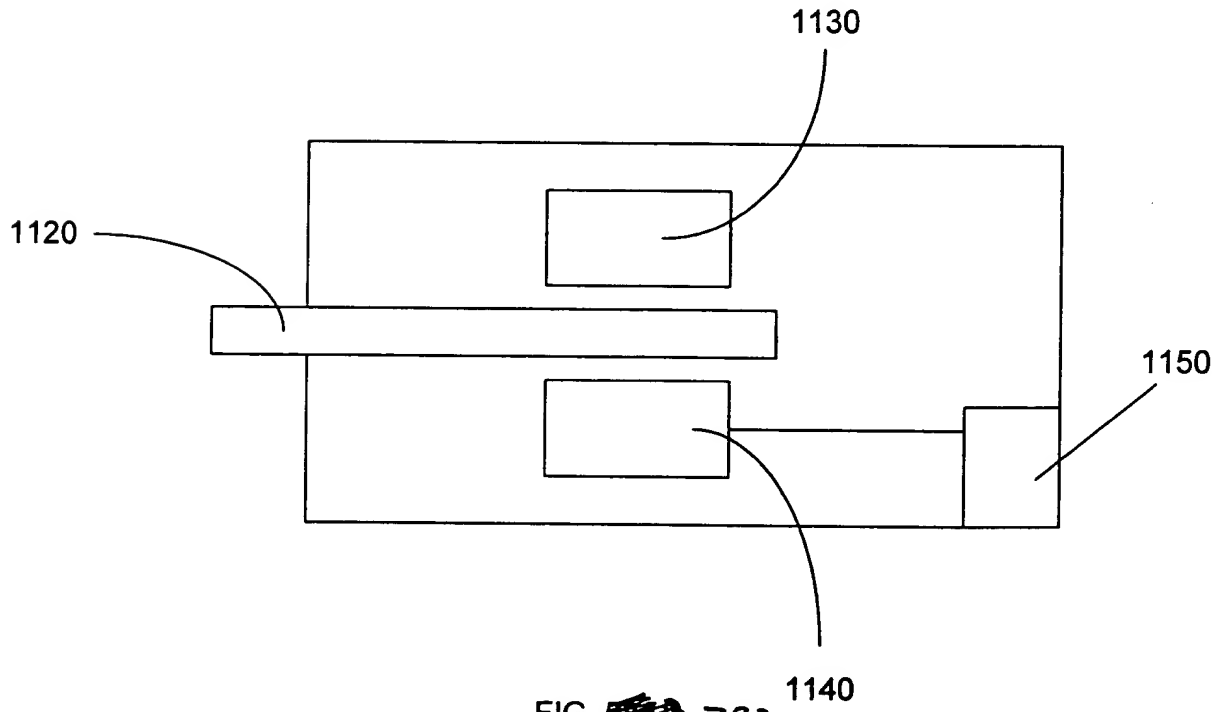


FIG. 79B

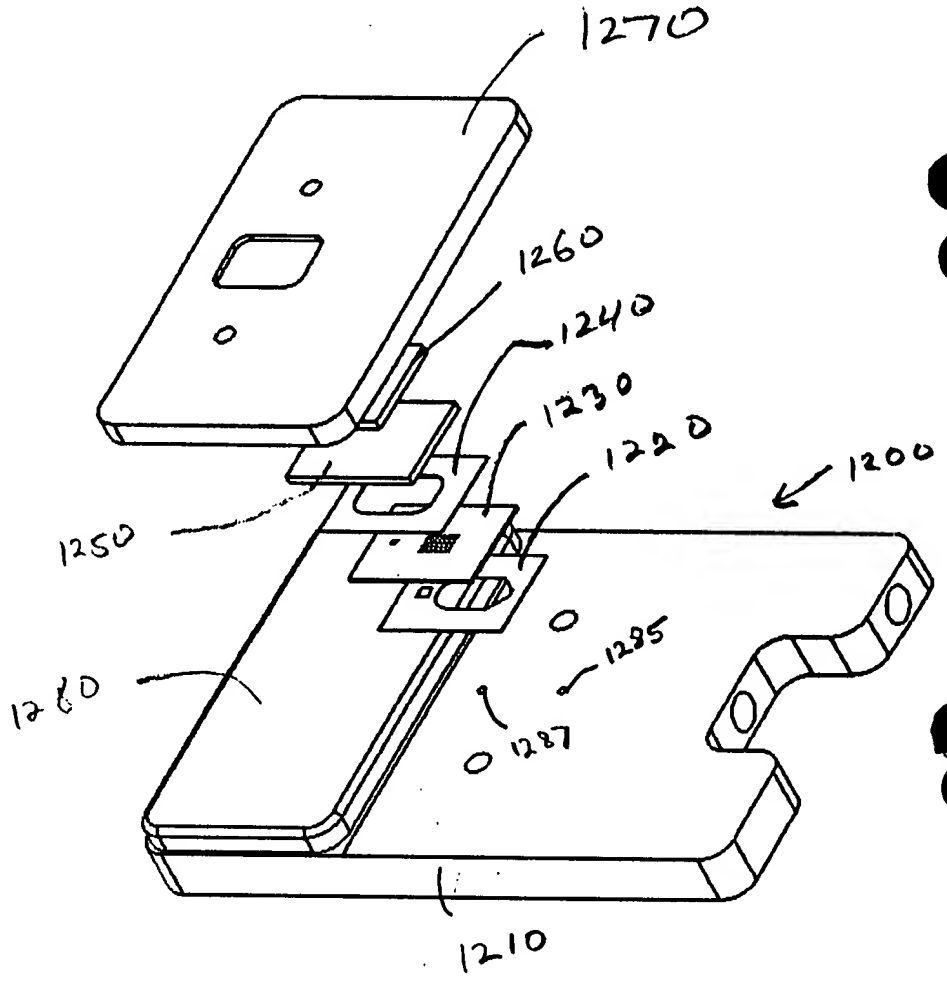


FIG 80

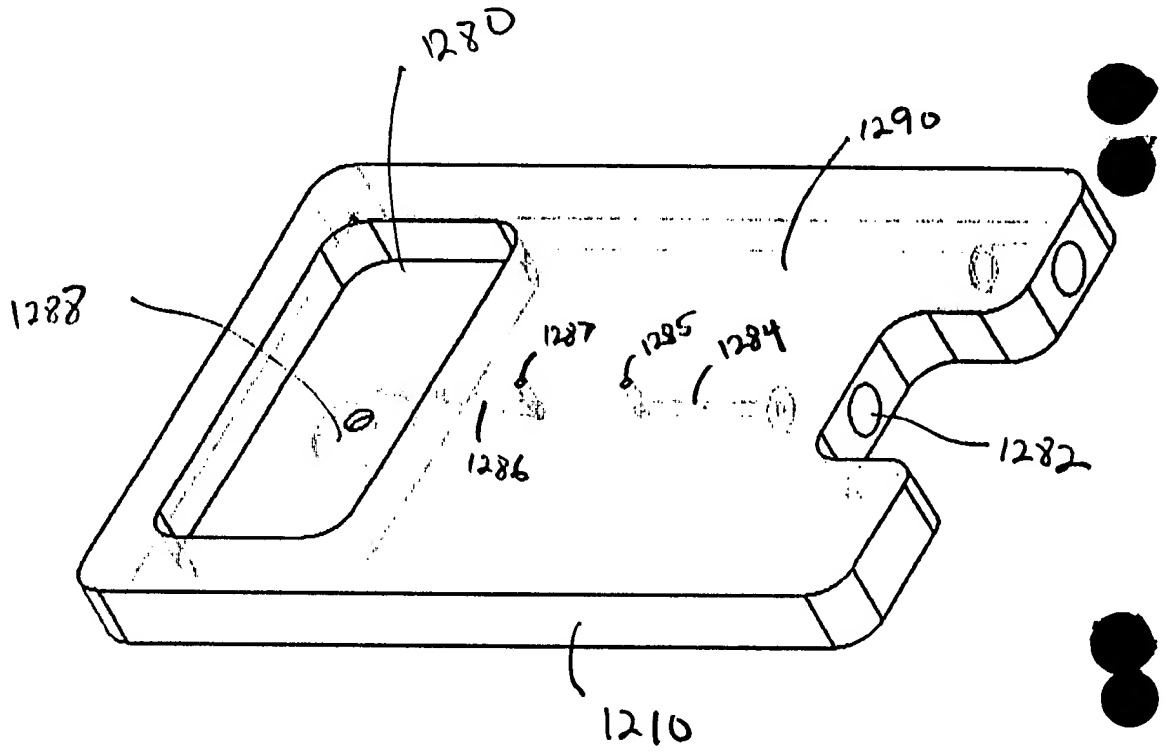


FIG. 81

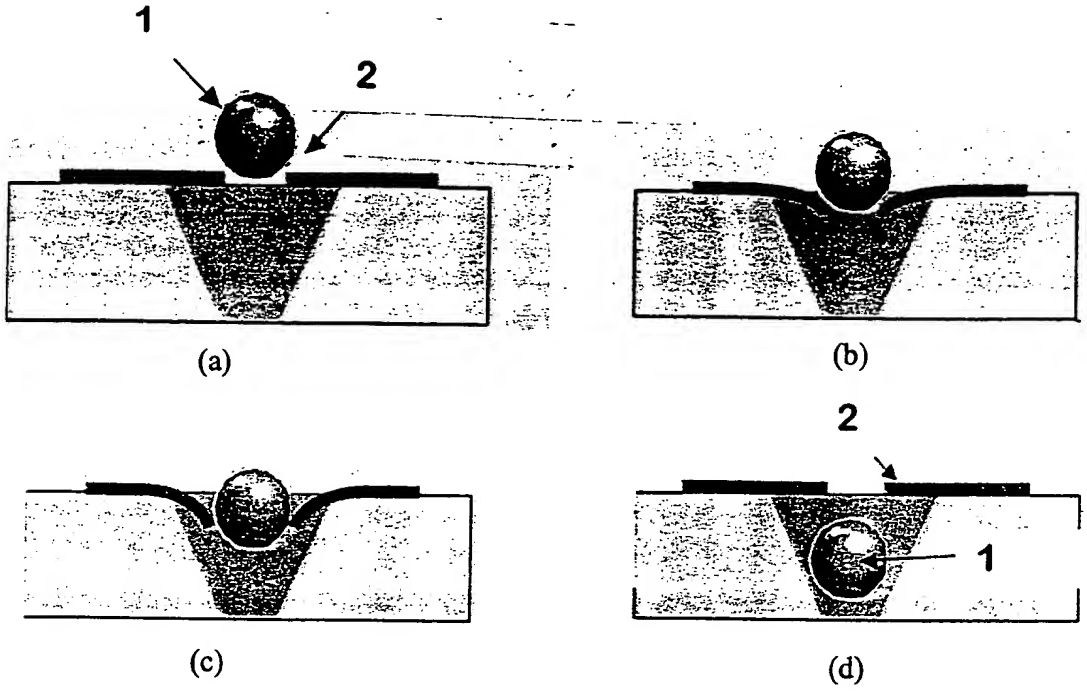


Figure 82